

Energy Management Training



Energy Efficiency Office

DEPARTMENT OF THE ENVIRONMENT

ENERGY MANAGEMENT TRAINING

This booklet is No. 85 in the Good Practice Guide Series and is designed to offer management guidance, technical advice and information on the implementation of energy efficiency training courses in industry.

Companion volumes in the same series are No 84 'Managing and Motivating Staff to Save Energy', and No 67 'Energy Champions : A Selection of Case Histories'.

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Other titles in the Good Practice Guide Series

1. GUIDANCE NOTES FOR THE IMPLEMENTATION OF SMALL-SCALE PACKAGED COMBINED HEAT AND POWER
2. REDUCING ENERGY CONSUMPTION COSTS OF ELECTRIC MOTOR AND DRIVE SYSTEMS
3. INTRODUCTION TO SMALL-SCALE COMBINED HEAT AND POWER
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FOREWORD

This Guide is part of a series produced by the Energy Efficiency Office under its Best Practice programme. The aim of the programme is to advance and spread good practice in energy efficiency by providing independent, authoritative advice and information on good energy efficiency practices. Best Practice is a collaborative programme targeted towards energy users and decision makers in industry, the commercial and public sectors; and building sectors including housing. It comprises four inter-related elements identified by colour-coded boxes for easy reference:

- *energy consumption guides*: (blue) energy consumption data to enable users to establish their relative energy efficiency performance;
- *good practice guides and case studies*: (red) independent information on proven energy saving measures and techniques and what they are achieving;
- *new practice projects*: (green) independent monitoring of new energy efficiency measures which do not yet enjoy a wide market;
- *future practice R&D support*: (purple) help to develop tomorrow's energy efficiency good practice measures

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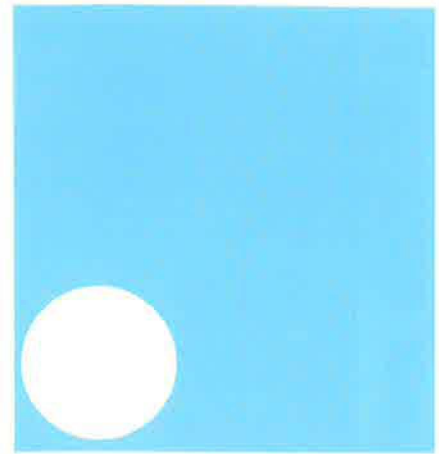
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INTRODUCTION

This Guide is intended to assist managers implement energy training. The aim of such training is to help organisations reduce energy consumption and costs **through people**.

Advice is given on a range of options and approaches to energy training, reflecting the varying needs of different organisations. The Guide describes:

- how to specify requirements to external training providers;
- a methodology for developing in-house courses.

There are several recent case studies which illustrate the principles of good practice - some of these are published as Good Practice Case Studies by ETSU on behalf of the Energy Efficiency Office (EEO) (see Chapter 6).

This wide-ranging Guide is designed to be of interest both to the Energy Manager who may have limited training experience, and those in a professional training function who may have limited knowledge of energy management. (In this Guide, the term Energy Manager is used for brevity and is meant to include both full and part-time personnel with responsibilities towards the efficient management of energy resources.) The principles described in this Guide are applicable to managers concerned with energy efficiency, not only in industry, but also in much of commerce and parts of the public sector.

The focus of the Guide is not on academic courses and qualifications in energy management which require full-time or part-time study. This ground is covered adequately elsewhere. The emphasis is much more on informing people at every level of an organisation about the options and benefits of training. This kind of training may involve anything from a one hour seminar to several days training spread over a long period.

In recent years, many organisations have reaped the benefits of running Motivation and Awareness programmes to save energy. These programmes can range from training just a few people to every member of an organisation. Such programmes are covered in this Guide, but for in-depth coverage of motivation methods, see Good Practice Guide No 84 - 'Managing and Motivating Staff to Save Energy'. The two Guides are designed to complement each other.

Many organisations recognise the need to save energy. Some have applied as much technology as possible and are now focusing on saving energy through people. Others have little capital to invest in technical solutions and regard savings through people as their only option. For both approaches, however, people need training to bring about change. They need to be given sufficient motivation, knowledge and authority to make things happen.

It is hoped that this Guide will act as a source of self-help and stimulation to make effective energy training a reality in your organisation, thereby reducing energy consumption, cutting costs and improving the environment.

The potential for saving energy

It is instructive to consider how UK energy patterns have changed since 1945. During the 1950s and 1960s, national energy demand increased proportionally with economic growth. When planning future energy demand, forecasters extrapolated the linear relationship between total energy demand and economic growth on the assumption of a 3% growth/year. The forecasters were, however, proved wrong in 1973, when the oil crisis shook world energy markets. The price of oil increased four-fold. The UK, along with many other countries, slid into recession and energy intensive industries either struggled to survive or collapsed. Although the economy was recovering by the mid to late 1970s, it was hit by a further five-fold increase in oil prices in 1979 following upheavals in the Middle East that affected world oil supplies.

Once again the UK slid into recession - shown in the top figure on the right by negative growth. It is interesting to note that during the 1980s, which was generally a time of economic growth, the UK was using considerably less energy than had been predicted in the 1960s. Similar patterns emerged in other developed countries.

The two main reasons for the reduction in energy demand were:

1. High energy prices focused attention on energy efficiency and the principles of good energy management. This highlighted how wasteful the UK had been in the past;
2. The UK manufacturing base has changed dramatically over the last 20 years, with a move from energy intensive industries like iron and steel to value added products, e.g. microchips, which require less energy to produce. There has also been a rapid increase in the service industries and a growth in invisible earnings. All these factors contribute to economic growth and wealth creation, but use considerably less energy.

On the basis of these statistics, it may be tempting to think that the UK is doing well in terms of energy efficiency. However, while progress has been made, our major competitors have been moving even faster, as shown in the figure to the right.

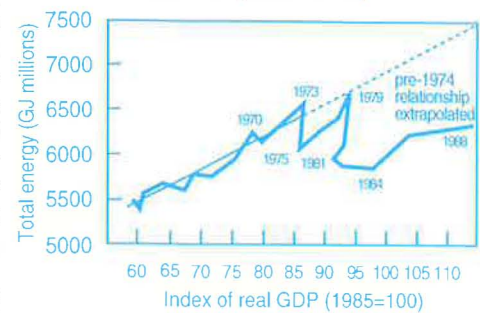
Japan is probably the most energy efficient nation in the world, yet it has virtually no indigenous energy supplies. In contrast, the UK is self sufficient in energy, but lags behind Japan in terms of energy efficiency.

While progress has been made in the UK during the last 20 years, there is considerable scope for further improvement. In 1992, the EEO estimated that, each year, the UK wastes £10 billion out of its total energy bill of £52 billion. Every organisation, building and home in the UK contributes to this avoidable waste, which is equivalent to the total annual production of North Sea oil and gas.

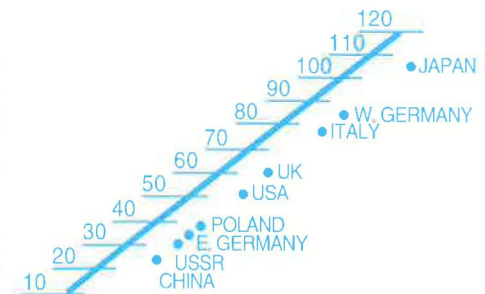
At a time of impressive technological innovation, it is easy to conclude that, in the future, machines and controls will solve every energy management issue and that the people factor will eventually be by-passed. The danger of this approach is that by looking for solutions in one dimension, we ignore the potential of people solutions. Japan is energy efficient because it applies both the latest technology and harnesses human resource potential to maximum effect.

However, we do not need to go to Japan for examples of good practice. Chapter 6 contains several examples from the UK industry, commerce and the public sector. Many of these organisations have applied both technology and people solutions and achieved considerable energy savings. Many of these principles will be applicable in your organisation.

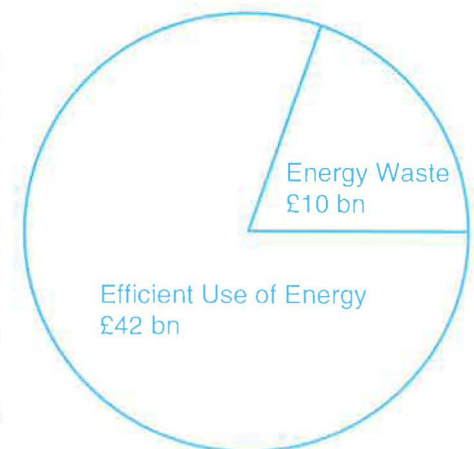
Final Users Energy Consumption in UK and Real GDP (1960 - 1988)



UK energy demand versus GDP



Wealth generation per unit energy consumption (GNP/GJ 1990)



Estimated UK energy use in 1992

Aim of energy management

The aim of energy management is to achieve organisational objectives at minimum energy consumption and cost. This might sound obvious, but there can be the danger that focussing on energy efficiency in isolation can lead to other vital elements or core business needs being overlooked. The message is simple - energy is there to serve both people and organisations. People are not here to serve energy, but to achieve organisational aims at minimum energy consumption and cost.

Energy management is a vital element in the total quality system of any organisation. It is therefore no coincidence that the best run companies in the UK are also the most energy efficient.

Key principles

The three key principles of energy management are:

1. Purchase energy supplies at lowest price;
2. Manage at peak efficiency;
3. Harness the most appropriate technology.

Purchase at lowest price

The gas, electricity and water industries have now been privatised and deregulated. Coal privatisation is yet to occur. Opportunities for careful purchasing and negotiation are available, depending on the amount of energy used in a given organisation.

Manage at peak efficiency

Having purchased energy at the lowest possible price, it is then important to use it as efficiently as possible and to avoid wastage. Some of the key stages in managing energy efficiently are:

- Development of an energy policy and strategy.
- Gaining commitment from top management downwards.
- Appointing an energy manager.
- Forming an energy task force.
- Ensuring that energy management staff are well trained.
- Allocating energy end-use responsibility.
- Conducting an energy audit.
- Implementing an energy monitoring and targeting (M&T) system.
- Having clear energy investment criteria.
- Ensuring energy efficiency is built into the design and planning of all processes, buildings and equipment.
- Ensuring energy efficiency is incorporated within planned maintenance procedures.
- Delivering specialist energy training to meet identified needs.
- Raising the motivation and awareness of all staff.
- Implementing publicity and advertising campaigns.
- Maintaining momentum by integrating energy efficiency into company culture and procedures.

Harness appropriate technology

Energy savings can be achieved by three levels of practical measures: no cost (good housekeeping); low cost; and high cost. These measures are summarised in the table below.

The critical factor in the success of No Cost measures is the involvement of people. With Low Cost and High Cost measures, the emphasis is more on technological investment, but *the people factor is still important*. There are, therefore, training requirements at all three levels.

Three levels of energy saving measures:

- No cost;
- Low cost;
- High cost.

Energy saving measures

Measures	Examples	Emphasis
No cost (Good Housekeeping)	Resetting controls Switch off when not required Repair leaks Reschedule loads/usage	Behaviour of people using existing installed technology
Low cost	Maintenance Meters M&T monitoring Simple controls Insulation Training end users	A combination of investment in low cost technology and people involvement
High cost	Heat recovery systems Combined heat and power Fuel conversion Energy management systems	Investment in high cost technology with some people involvement

No Cost measures are usually taken by people and here the emphasis is on using existing equipment at peak energy efficiency. This implies that people are aware, motivated and empowered.

Low Cost measures represent a move towards technology for solutions, but with a substantial input from people; for example, the measure may have been suggested by a member of staff.

High Cost measures emphasise technology to achieve energy savings. A High Cost measure must be subjected to a careful technical and financial analysis before a decision is taken to invest capital. But even at this stage there is a level of people involvement e.g. once a sophisticated energy management system (EMS) is installed, someone is still needed to oversee its operation. Energy consultants conducting energy surveys often find that many of the useful energy management facilities on EMS are overridden or not used, because the person originally trained to use them had retired or moved jobs, and no replacement has been trained.

In order to harness the appropriate technology, the correct blend of people and technical solutions must be applied at each stage. Wherever people are involved, there is a training requirement. Wherever technology is involved, the user must be capable of determining whether it is functioning correctly. This is regardless of whether the user has a technical or non technical background and this represents a further training requirement.

Energy management is primarily a management function with technical implications.

Energy training as an integral part of an energy management strategy

In the past, energy has often been treated as a purely technical function. Many organisations, however, are now realising that the issue is primarily a management function with technical implications. Several of the case studies in Chapter 7 illustrate the importance of the management approach, and Appendix A gives details of EEO initiatives to encourage a 'top down' commitment to energy management. Training plays a vital role in this approach to energy management.

When considering initiatives in energy management training, it is important to carefully consider the two contexts in which training takes place:

- operational or energy management context;
- organisational context.

Operational context

It is vital to consider energy training as one important aspect of an overall co-ordinated approach to energy management. Other key aspects are summarised in the figure opposite. If energy training is attempted in isolation or in the absence of other key aspects such as monitoring and targeting, publicity, etc, then its impact is likely to be small.

Energy training has a significant relationship to all the other key aspects of energy management, e.g. if there is no capital available for energy saving projects, then it is wise to design a training programme to harness No Cost energy savings.

The training programme must also anticipate likely future changes in the energy management context; for example, legislative changes in the utility supply industries.

Organisational context

Every organisation has a cultural context that reflects the vision, values and behaviour of the employees. These factors must be taken into account, because energy management - and therefore energy training - takes place in this context. The way in which energy management functions will be determined by the cultural context. A simple definition of company culture is 'the way things are done around here'.

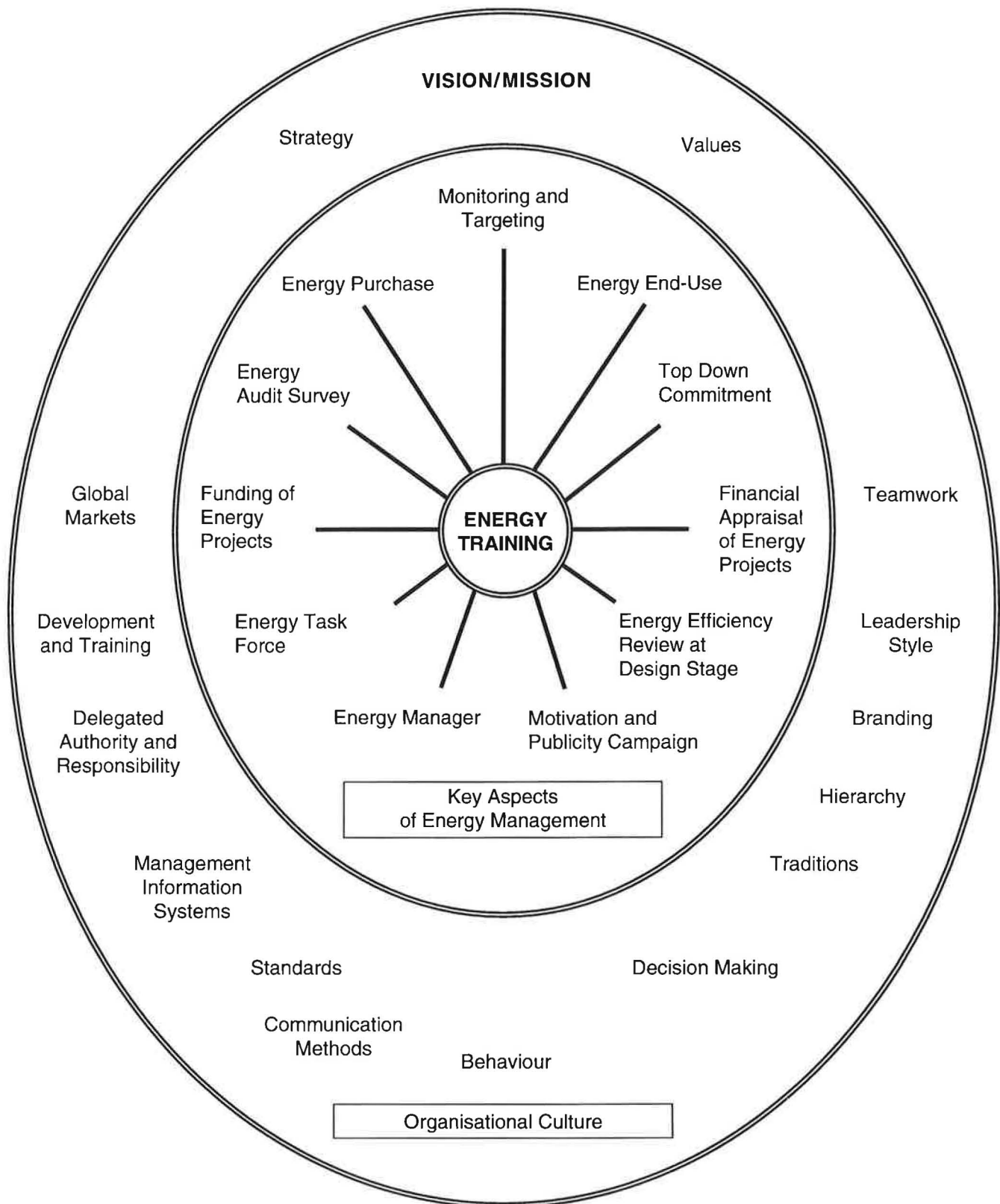
As energy management operates within a culture, it is very important to identify what constitutes that culture and the factors which make things happen within an organisation.

Every company culture is unique. It is shaped by the organisation's mission, work practices, ethics, management style and will therefore shape the way operations are carried out. For example, if an organisation is strong on management information systems as a means of control, then this is a helpful context within which to introduce the concept of monitoring and targeting. Conversely if a company attaches a very low value to training in general, then it will be difficult to sell the concept of energy training to middle and senior management.

Much of this may seem obvious, but in the past a purely technical solutions approach to energy management has not delivered the results. The UK has all the technical solutions to energy efficiency it needs, but energy wastage is still £10,000 million/year.

The solution has to be a combination of technical solutions and good management practice. The main barriers to implementing energy efficiency lie in the management approach - and this is heavily influenced by organisational culture. Therefore it is vital to recognise that energy training takes place in an energy management context that in turn takes place within the cultural context of an organisation. It is therefore vital to identify both the opportunities and obstacles to energy efficiency in every organisation. This analysis should influence the type of training adopted, the content of the training programme and the training methods used.

The way in which energy management functions will be determined by the cultural context.



Energy training in relation to energy management and organisational structure

Management attitudes

Some energy training programmes have little impact because delegates know that senior and/or middle management are not really interested in energy efficiency. In such conditions, the barriers to change will be almost insurmountable, no matter how well the energy training is organised or delivered.

To avoid some of these pitfalls, it is worth asking yourself the following questions before embarking on an energy saving programme. Some of the questions relate to the groundwork needed to prepare the way before the training programme begins, while others focus on the mechanisms that need to operate after the training is completed.

1. Do we have a clear energy strategy and policy that is written down and approved by the Board? Has the Chief Executive or Chairman signed the 'Making a Corporate Commitment' campaign document? (see Appendix A for further information).
2. Is there a written and published energy management policy and strategy? Are senior management committed?
3. Has an energy audit/survey been conducted to determine the potential areas for energy savings, including High, Low and No Cost measures? How old is the survey? Does it need updating?
4. Have financial resources been allocated to pay for the training programme? If not, should they be built into next year's budget? Could the cost be shared with other budgets e.g. training, energy, environmental, maintenance? Is there a mechanism for funding energy saving projects from past proven savings?
5. Is there an energy monitoring system in place? If not, how do you intend to measure the effectiveness of the proposed training?
6. Have managers been informed of the proposed programme which may involve them releasing staff for training? Do they also need energy training to gain the necessary corporate commitment to the programme?
7. If an external supplier is supplying training, will there be someone available from the organisation to handle specific issues related to our site?
8. Has a training needs analysis been conducted?
9. Are the training objectives clearly defined? How do they relate to our business aims and specific energy management strategy objectives?
10. Will the delegates' response to the training they receive be evaluated?
11. Are energy ideas/suggestions generated during the training sessions by delegates directed to the Energy Task Force/Committee? Does the Committee have the authority to implement the ideas generated? What mechanism is in place to provide feedback to delegates on the ideas they generated, irrespective of whether they are implemented or not?
12. Will there be feedback on the quantified energy savings achieved in the months following delegate training to show them the impact of their efforts?

13. Is it possible for the energy monitoring system to differentiate between those energy savings achieved by good housekeeping measures and those achieved by Low Cost or High Cost investment?
14. What plans exist to integrate energy training into the organisation's training programme? For example, inclusion of an energy efficiency module during induction training for all new employees. Or in a Total Quality Management (TQM) programme?

2

AWARENESS, MOTIVATION AND REWARDS

In many organisations, there is enormous potential to save energy by good house-keeping (No Cost measures), and by raising the awareness and motivation levels of staff who are end users of energy. Savings of 10 - 15% of the total annual energy bill can be achieved. End users should be encouraged to avoid waste and to take personal initiatives to save energy. However, changing attitudes, behaviour and habits can be difficult.

Awareness

Awareness examines the *WHATS*:

- ? What is energy?
- ? What is the organisation's energy policy?
- ? What different types of energy are used?
- ? What does energy cost?
- ? What is the potential for saving energy?
- ? What can be saved?

Motivation

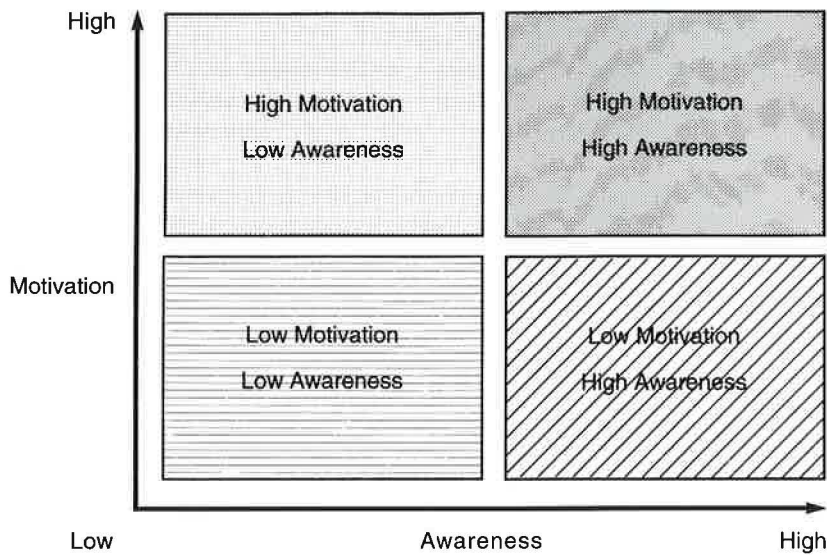
MOTIVATION examines the *WHYS*:

- ? Why save energy?
- ? Why is it important?
- ? Why should I bother, when others don't?

Before embarking on any training programme, it is necessary to identify where your staff are located in the Awareness/Motivation grid. Are they motivated, but unaware? Or demotivated, but quite aware? Or perhaps both demotivated and unaware? Wherever they are, everyone needs to be moved to the High Awareness/High Motivation quarter of the grid if significant savings are to be achieved.

Different people will be at different parts of this grid. Before designing an energy training programme, it is important to determine where people are in their levels of awareness and motivation.

One method of achieving this is to devise a simple questionnaire with questions that focus on knowledge (awareness) and attitude (motivation) levels. The questionnaire should be tailored to the specific organisation/section/department to which the *staff belong*.



Awareness/motivation grid

One of the easiest moves is from High Motivation/Low Awareness to High Motivation/High Awareness; the motivation is already there, it is simply the awareness that is missing.

Three examples of moves within the Awareness/Motivation Grid are described below.

Example No. 1: Small Industrial Company

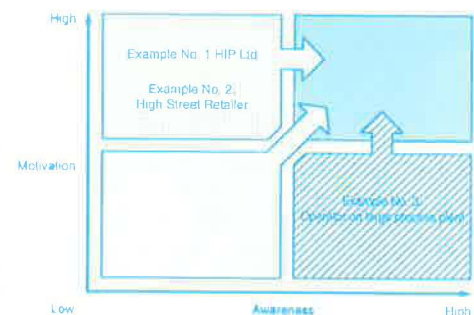
A good example of the move from High Motivation/Low Awareness to High Motivation/High Awareness is described in Case Study 1 (see Chapter 6). This features a small industrial company, HIP Ltd where the Works Manager sent himself on an energy management course, returned to work and put into practice the principles he had learnt. The result was a 22% reduction in energy costs.

Example No. 2: High Street Retailer

Another example of moving from low to high levels of awareness involves the Branch Manager of a high street retail store. It was explained to the Branch Manager by her Area Manager that the energy costs per m² of sales space were particularly high. The Branch Manager called in her local electricity supply company to explain the constituent parts of the electricity bill. After discovering the costs of Maximum Demand, the manager monitored the electrical demand meter closely and re-timed the air conditioning to come on 30 minutes later each day. This significantly reduced both energy demand and costs.

Example No. 3: Large Process Plant

A consultant was conducting an energy attitude survey with process operators on a large industrial plant. One operator commented that he had several good energy saving ideas, but refused to divulge them. The reason? He had previously made a suggestion for improving product quality and significantly reducing energy consumption on a piece of process equipment. The idea was implemented and the company is now saving tens of thousands of pounds. The operator received no thanks, no recognition and no reward. His manager took the credit. Trust, along with further potential for saving energy was destroyed. This is an example of High Awareness/Low Motivation, but one that is likely to remain stationary. Training is not likely to influence this operator. An apology from his manager could be the first step in resolving the issue.



Reasons for saving energy

Before undertaking any training, it is worth considering two questions:

1. *Why does the organisation want to save energy?*

Most senior managers would be surprised to even hear the question asked because to them the answer is so obvious 'Save energy to save money to cut costs to improve profits to provide investment to increase market share.....'

This answer reveals that the prime motivation to save energy for most senior managers is to cut costs.

2. *Does cost-cutting and profit boosting motivate the people in the organisation who are actually going to carry out energy saving measures?*

The answer is usually 'No'. These well-worn reasons do not generally motivate staff.

Senior management's logic of 'Save energy because it saves money for the company' usually only works in two specific situations:

1. Private sector companies making little or no profit. Saving money by saving energy could make a real difference to profitability and safeguarding jobs - particularly if the company's activities are energy intensive.
2. Private sector companies where all employees have a stake in the firm in the form of shares or profit-related bonuses. Then, wasted energy means lower personal incomes.

The key to motivating employees usually lies in areas other than simply company cost saving.

The key to motivating employees usually lies in areas other than company cost saving. While cost saving is still management's main motivation, a smart organisation will piggy back on the likely personal values and interests of employees. These personal values are the long-term self-motivating factors. It might seem obvious, but one simple way to find out what would motivate staff to save energy is to **go and ask them**. It is easy to assume that what would motivate you would motivate others. The 'asking' can be done informally using 'Management By Wandering About' methods and informal discussion. Or it can be done more formally by surveys and questionnaires.

So what are the key areas that are likely to appeal to employees' personal values? Here are some of them:

● **Environmental Issues**

In 1991, the Department of Environment published a survey, *Attitudes to Energy Conservation*. One startling conclusion from this survey was 'Most householders are unaware that energy used in the home is a major cause of global warming.' The report is interesting in that it revealed that the majority of the public are unaware that home energy use directly impacts the environment. This means that most people in your organisation have yet to make this connection in their minds.

During training programmes to raise staff motivation and awareness to save energy, it is important to explain that energy management at home, at work and in their transport habits is the single largest contribution they themselves can make to be 'green'.

Employees are often more likely to be motivated to save energy to help save the environment, than to save their employer money.

Experience shows that information on the environmental impact of energy makes a deep impression on employees when communicated in an appropriate manner. The current media interest in environmental issues helps to reinforce this. Several companies have reported that women employees, in particular, respond to the environmental aspects of energy awareness courses.

Many people are surprised to see how many of the world's environmental problems are energy related. *It is a revelation to most people that they can be part of the solution to environmental concerns, instead of just being part of the problem.*

The environmental impact of energy usage makes a deep impression on employees.

Many hotels are now putting signs on the back of hotel room doors saying, 'Please help to conserve the earth's finite energy resources by switching off all lights and equipment when you leave your room.' Such signs could read 'Please help to improve the profits of this hotel by switching off' - but which is more motivating?

- **The Home**

The principles involved in saving energy in the home are the same as those involved in saving energy at work. The details and scale may differ, but the same attitudes and principles apply.

It is unusual for a person to be wasteful of energy at work and be highly efficient in energy use at home. In motivation programmes, this area frequently captures people's interest. Self comfort and self interest are key ingredients - and the '*saving energy = saving money*' equation does work at a personal level. Appropriate input at this interest level can also help to dispel myths e.g. many householders equate double glazing as a good energy saving investment and neglect low cost, fast payback measures like insulating immersion tanks.

Case Study 2 (see Chapter 6) involving British Aerospace featured the training of middle management in energy awareness and motivation. Course work was assigned to delegates who had to report back at the following session. One assignment, chosen to enhance awareness of energy cost and key areas of usage, was for each delegate to conduct an outline energy audit on their own home. It led to savings for some delegates, but more importantly it highlighted the similarities between home and work. This proved to be a popular aspect of the training.

- **Recognition and Reward of Achievement**

Many people think of reward in purely financial terms, but public recognition, such as an annual prize giving ceremony conducted by the company chairman or a public figure at a top class hotel followed by lunch, can have a very positive impact on an individual or team who have made a significant contribution to energy efficiency.

Many organisations run suggestion schemes. Energy saving ideas should be positively encouraged, recognised and rewarded.

Although employee motivation usually lies in areas other than cost saving for the company, it has to be acknowledged that in some situations financial incentives for teams or individuals can help. The integration of financial incentives into the training strategy is illustrated in the case histories at the end of this chapter.

In the UK, management is singularly poor at rewarding staff who have performed well. There is immense goodwill and creativity waiting to be unlocked.

- **Something for Others**

The desire to help the needy in society is a well-known trait in the British character. People do get motivated about saving something for others. Some organisations carefully monitor savings achieved by No Cost measures, and donate a portion of the savings to a charity nominated by employees. One of the benefits of this approach is that a team effort is required to achieve significant savings. An individual working in isolation will not make it happen. This approach also avoids the problem of giving cash rewards to individuals, which can be divisive.

- **Energy Efficiency as a Corporate Value**

In most organisations, there are key words that are meaningful to those working in the corporate culture e.g. safety, quality, customer care, etc. People accept these values as the normal way of conducting business. One long term aim should be to integrate energy efficiency into company culture.

One long term aim should be to integrate energy efficiency into company culture.

While many organisations have adopted Total Quality Management (TQM), few have included energy efficiency in their programmes. Once energy efficiency is integrated into TQM, health and safety programmes, induction courses and environmental initiatives, it becomes an in-built part of company culture. This avoids the 'bolt-on' approach or the short-lived campaign approach to raising awareness and motivation.

Another reason for integrating energy efficiency into on-going programmes is that staff can get weary of new initiatives and change programmes. If there have been initiatives in the past that have been taken seriously for a few weeks and then forgotten, it is difficult to raise enthusiasm if energy efficiency is seen as yet another temporary emphasis.

Determining the personal values of employees is the key to long-term motivation.

Rewards as incentives in energy programmes

Motivation is a complex subject as different things drive different people. A key to long-term on-going motivation is to determine the personal values of employees and consider how to build on these in the design of an energy saving programme. The question should be asked:

'What role do financial rewards play in raising motivation and awareness to save energy?'

While experience shows that financial rewards can play a role, it is important to proceed cautiously. The following case histories demonstrate both positive and negative aspects of offering financial rewards.

Case History No. 1

All operating staff at a large food processing plant work through 20 training modules covering every aspect of their work, including hygiene, safety and quality. The Energy Manager worked carefully with the Personnel Department to ensure that one of the training modules was concerned with energy efficiency. All the training modules are mandatory and a satisfactory written test is required to pass each module. On-the-job performance is also observed and assessed. When the 20 modules have been successfully completed, the employee qualifies for a bonus. Each employee is reassessed annually. If performance falls, the bonus is removed.

Case History No. 2

The catering in a large manufacturing company was contracted out to private caterers, but the company paid the gas, electricity and water bills. Sub-meters were installed and an accurate assessment was made of the total energy consumption per average meal.

When the catering contract came up for renewal, the company built into the new contract a clause stating a fixed energy consumption per meal as part of the tender. The successful contractor then had the double-edged 'carrot and stick' motivation. If the contractor produced the required quality of catering using less than the contracted energy consumption per meal, then the contractor made more money. But if the catering staff were inefficient and used more energy per meal, the contractor lost money. The result was that the contract catering manager and his staff took energy efficiency very seriously. Training was initiated and energy/water monitoring was integrated into the existing catering management information system.

Case History No. 3

As part of an energy awareness programme in a hospital, the Estates Manager agreed with the accountants that 15% of the monitored energy savings could be allocated towards a fund to purchase a brain scanner. The medical staff were motivated by this initiative because they knew how badly the hospital needed this

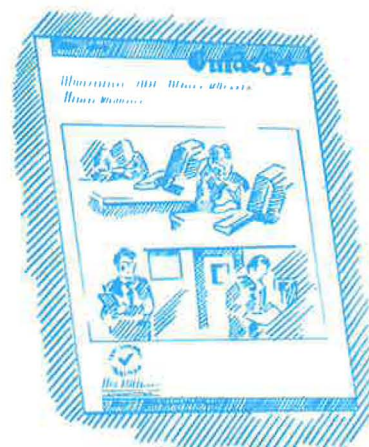
Case History No. 4

A large retailing company integrated energy information into its standard computerised management information systems. This allowed instantaneous analysis of the energy management performance of each store. Energy management performance graphs showing energy consumption against target were sent to each Store Manager monthly.

If the target was met, the Store Manager qualified for special holiday vouchers. No other staff were included in the scheme nor were they aware of its existence. So the responsibility and motivation rested with the Store Manager, who needed to apply his management skills to achieve energy savings through others. Many Stores Managers succeeded by training their staff in good housekeeping measures. This resulted in the managers qualifying for the vouchers. However, when the scheme ended, energy consumption began to rise.

Detailed coverage of motivational methods is outside the scope of this publication. For further reading, see the companion Good Practice Guide No 84 - 'Managing and Motivating Staff to Save Energy'. Copies of this Guide are available from the Energy Efficiency Enquiries Bureau, ETSU, Harwell, Didcot, Oxfordshire OX11 0RA. Tel: 0235 436747. Fax: 0235 432923.

Interested readers will also benefit from reading General Information Reports 12 and 13 - 'Organisational Aspects of Energy Management' and 'Reviewing Energy Management' respectively - which offer advice on reviewing energy management and the effectiveness of current organisational policies. Copies of these reports are available from the Enquiries Bureau, BRECSU (Building Research Energy Conservation Support Unit), Building Research Establishment, Garston, Watford WD2 7JR. Tel: 0923 664258. Fax: 0923 664787.



3

DEVELOPING A TRAINING PROGRAMME

Training options

Once some initial training needs have been identified, it is worth considering which training option(s) is likely to be the most effective. The table below summarises some typical options for energy training, highlighting their advantages and disadvantages. The list is not exhaustive, but it gives an indication of possible areas to investigate.

	OPTION	EXAMPLE	ADVANTAGES	DISADVANTAGES
1.	Tailor-made training run on-site using external training providers or internal trainers.	Three hour motivation/awareness course for plant operators.	Cost effective. Tailored to site, job functions and training needs. Opportunity to discuss ideas with colleagues.	Lack of exposure to ideas from outsiders. Delegates may lack concentration if training is run after normal working hours.
2.	Short open courses.	Three day course on energy savings in air conditioning plant for maintenance engineers.	Can be targeted to individuals with identified training needs. Mixing with outsiders can stimulate application of good practice.	Some of the course may not be relevant. Delegates have to sell good ideas when they return to work. Travelling time/accommodation costs can make expensive.
3.	On-the-job training.	Supervisor or senior operator training new staff to run boiler plant efficiently and safely.	Practical, cost effective, informal, plant specific and tailored to individuals receiving one-to-one training.	Informality and lack of structure can lead to omissions. Bad habits and unsafe practices can be passed on. Basic principles may not be explained.
4.	Academic courses leading to recognised qualifications.	Masters degree or diploma in energy management.	In-depth training. Formal recognition of success. If full-time study, the ability to focus without work-place pressures.	Limited practical experience. Some parts of course may not be relevant. Management aspects may not be emphasised. Cost can be high.
5.	Open learning materials.	Distance learning packages on energy management.	Cost effective. Delegates study at own pace and in own time. Flexible.	High level of individual motivation required. Content not usually tailored to site conditions or individual training requirements.

The choice of training option depends on the numbers to be trained, training needs and how the training fits into the overall energy management strategy.

If your organisation has conducted little or no training in the past, a two stage approach should be considered:

1. An initial training programme to run over a period of weeks or even months;
2. A strategy for integrating energy efficiency training into existing company systems e.g. induction courses, TQM programmes, job descriptions, staff appraisals, health and safety training, environmental initiatives, production meetings and maintenance programmes. This will ensure that energy efficiency is not overlooked and that it will be regularly reviewed.

This section will focus on running an initial training programme.

Scope of training

The question of costs is usually raised at an early stage. This is related to the training needs of the relevant individuals. The questions that need to be addressed include:

- How much should be spent?
- What is essential?
- What would be the best use of resources?
- What is unnecessary?

As a rule of thumb, and based on the experience from case studies (see Chapter 6), the potential for No Cost energy savings ranges from 3% to 15% of the site's annual energy bill. To make energy training a low risk option, expenditure of 1% of the site's annual energy bill is probably a prudent investment in energy training. It is highly likely that this amount would be recovered within a few weeks, or even days in some cases, depending on the initial level of awareness and the energy saving potential of a particular site.

Timing of programmes

It is important to consider the timing of an energy awareness programme. If there are external factors that are likely to impact on the motivation of delegates e.g. imminent large scale redundancies or plant closures, then it is obviously wise to postpone the programme. However, continuous rapid change is now almost normal for many organisations and the likelihood of 'steady state' or ideal conditions is rare. Therefore, an optimum time should be identified and the programme launched.

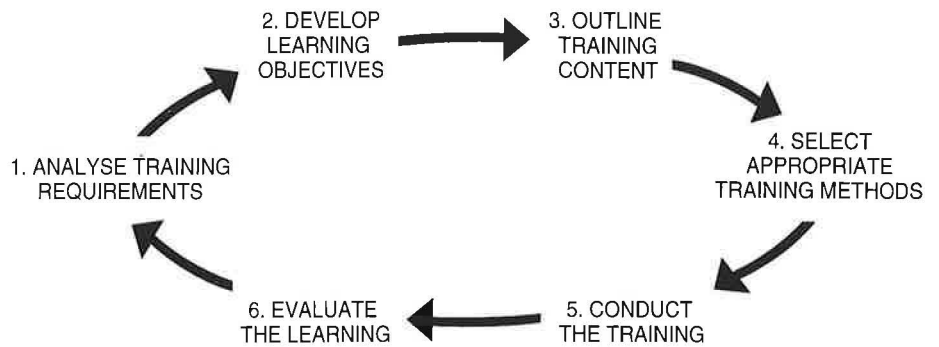
The six basic steps

There are six basic steps in the development of a training programme:

1. Analysing training requirements.
2. Developing learning objectives.
3. Outlining training content.
4. Selecting appropriate training methods.
5. Conducting the training.
6. Evaluating the learning.

Your organisation may not have the staff resources to do all or part of each of these steps. If this is the case, Chapter 4 on the use of external training providers will be of help.

Irrespective of who carries out the training, it is important to understand the steps involved so that the person responsible for the programme can effectively supervise either internal training resources or external training providers.



Step 1 - Analysing the Training Requirement

This is an important step because it will help in planning the major elements of the training. Care should be taken over this training needs analysis. It can be conducted either in-house or by an external training provider. The table below summarises the seven key elements to consider when analysing training requirements.

Analysing the Training Requirement

	Elements	Key Issues
1.	Statement of Training Requirement	A short description of the training requirement as perceived at present
2.	Reason for the Training	Identification of those requiring training. Consequences of providing/not providing training. Desired effects on learners job performance. Can needs be met by other means?
3.	Identification of Learners	Who are the learners? Familiarity with the training content? Anticipated response to proposed training? Are there factors in the organisation which could negatively/positively impact the proposed training?
4.	Analysis of Training Needs	The nature of the training content, possible resources and any foreseen difficulties.
5.	Identification of Trainers	Who is qualified and available to deliver this training? Will they be involved in designing the training?
6.	Programme	Timing issues. Start date. Length and frequency of training. Availability? Problems in releasing learners? Shift cover?
7.	Location/Resources	Location and number of learners. Space, equipment, manuals, other resources.

Energy is used by every member of every organisation.

Who to train?

When conducting a training analysis, it is important to identify who needs training to achieve the specific objectives.

Every member of every organisation is a user of energy. However, some employees control more energy than others, e.g. a process operator will have more influence over energy end use than a typist. So a key question is:

'Which employees will be the most cost-effective to train?'

If the aim is to raise awareness so that energy efficiency becomes part of the corporate culture, then **everyone** needs some training, as is the case when introducing a Total Quality Management (TQM) programme. Some organisations ask all staff to attend a seminar, typically of three hours duration. This means that there is upwards, downwards and sideways pressure to save energy because 'everyone knows that everyone knows', since everyone has received the same training input.

In many organisations, however, there are usually specialist staff who have either the authority to make things happen or who control energy use in practice. These people often fall into two broad groups: Operators and Management.

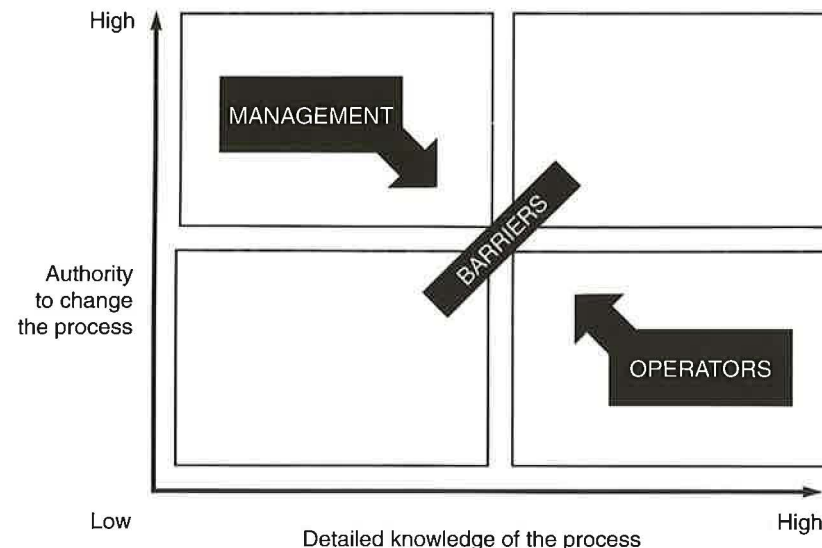
It is important to tailor courses for more specialist groups so that the training is geared to everyday jobs and functions. However, it is sometimes useful to get people from different groups together on training courses to speed up communication and overcome the barriers which can arise between management and operators. For example, operators often have a good knowledge of the plant or building, but usually have little authority to make changes. Conversely management have the authority, but often are not knowledgeable about those details which the operators see each day as part of their jobs. Training operators and management together can act as a means of overcoming communication barriers. An example of this approach is shown in Case Study No. 6 (Page 41).

Operators:

- Process operators
- Maintenance staff
- Cleaning staff
- Caretakers
- Catering staff
- Security staff
- Subcontractors

Management:

- Chief executive
- Directors
- Financial managers
- Area managers
- Production managers
- Plant managers
- Computer staff



Top down commitment is a key element of a successful training programme.

Top down commitment

Many of the case studies in Chapter 6 show that top down commitment is a key element of a successful training programme. This is true when introducing any new concept that requires organisational change and commitment.

In order to achieve this commitment, it is useful to nominate a board level Director as an energy 'champion' who can drive the process from the top. This was particularly true in the case studies featuring ICI Fine Chemicals (now Zeneca Pharmaceuticals), Cleveland Potash and Rover Group (see Chapter 6).

Another useful way of gaining top down commitment is to run a short, incisive seminar on energy efficiency training as part of a normal board meeting. Such a seminar can easily be run by someone from within the organisation, but many companies report that an outside expert is sometimes more effective at board level. This is not because the outsider is necessarily more knowledgeable, but because he is an outsider. Another reason for using an outsider is that they can afford to be more direct with the board about the lack of commitment or resources being put into energy management. The outsider has little or nothing to lose by stating the facts.

Different courses for different needs

In some organisations, it may be necessary to design several different courses with differing objectives, content and methods geared to specific job functions. It is worthwhile drawing up a matrix of job functions against possible courses or course content to act as an initial guide on **who** requires **what**. This matrix can also be used to identify the numbers of people to be trained and which functions have the highest potential to reduce energy costs.

Appendix C contains an example matrix completed matrix for a fictitious company, together with a blank matrix which can be photocopied and used. A simple matrix of this type can be useful when analysing key people groups. In practice, it is unlikely to be cost effective to cover every box ticked, but such a matrix can be helpful in the initial screening process.



Step 2 - Developing learning objectives

It is important to develop clear and concise learning objectives for energy training, as is the case for any kind of training.

Learning objectives focus the minds of both the trainer and the learners on the achievement of specific results:

1. They guide the **trainer** towards developing and delivering training that provides the learners with the skills, knowledge and attitudes they need;
2. They provide the **learners** with a clear understanding of what will be required from them as a result of the training.

For training to be effective, the typical tasks that the learners will perform as a result of the learning process must be identified.

Writing down learning objectives is often more difficult than it first appears. Objectives related to skills are relatively easy to define, but objectives must often be related to changes of knowledge and attitude.

When writing down learning objectives, it is important to remember that the critical point is to communicate clearly the behaviour that must be shown by the learner so that both the learner and the trainer know that learning has taken place.

Finally, learning objectives should be expressed from the learner's point of view. Remember that you are defining what you want the learner to be able to do as a result of the training, not what you as the trainer want to accomplish. Starting all of your objectives with the phrase 'At the end of the training, the learners will be able to.....,' will help to keep this in mind.

Example of learning objectives

An example of learning objectives is shown in the figure to the right, which lists the objectives for a half day session given as part of a ten day course on boiler house management. Note that the first five objectives begin with the word 'State' - implying knowledge transfer. The sixth objective begins with the word 'Operate' - implying skills transfer.

Step 3 - Outlining training content

The training content will naturally flow from having written clear concise learning objectives. The content should reflect everything that the learner will have to learn in order to achieve the objectives.

It is useful to outline the initial training content for the following reasons:

1. To generate possible ideas from which to choose the essential content;
2. To allow discussion with others who have a vested interest in the content. They can often make useful suggestions;
3. Feedback can be used when firming up the ideas into a logical order for presentation during the training session;
4. It serves as a check-list.

It is an important discipline to outline the content. It is also vital for the training designer to continually put himself/herself in the position of the learner in order to check that the content is relevant and not too elementary/advanced. Outlining the content will also indicate roughly the time required for the training objectives to be met. Often the time allocated for training is set before either learning objectives or training content have been determined. If the time allotted is too short, this can lead to rushing the content or a lack of depth in training. It is rare to have to struggle to find content simply to fill time; trainers tend to try to cover more material than the time available.

Step 4 - Selecting appropriate training methods

Having determined training objectives and content, it is important to select the most appropriate training methods. The interest and participation of the learners will be sustained, provided that the correct mix of methods is selected.

Educationalists agree that people learn most when they are involved in some direct way in the learning process. To achieve the greatest impact, the trainer should involve the learners as much as possible, using small group discussions, role play sessions, group and individual projects, delivering and evaluating presentations, question and answer sessions, etc.

The trainer should act as a stimulus, a catalyst, a facilitator and a coach, bringing out the best in people, raising issues and helping learners to identify needs and discerning what should be done to improve their knowledge, skills and attitudes. In any one training session, it is good to use a variety of means and methods. This ensures a greater degree of interest, keeps learners 'on their toes' and enables you to get a greater appreciation of how each learner functions in different situations. The table lists a selection of the many training methods that are available, along with their advantages and possible limitations.

Example of learning objectives (Source: RTCC Cardington)

BOILER HOUSE MANAGEMENT COURSE: COMBUSTION MODULE

Training Objectives

At the end of the training session the learners will be able to:

1. State the reasons for maintaining efficient combustion;
2. State the types and composition of fuels;
3. State how fuel burns and the reasons for excess air;
4. State the products of combustion and heat losses through the boiler;
5. State methods of calculating gross and net efficiency and what they mean;
6. Operate portable instruments for flue gas analysis.

People learn most when they are involved in a direct way in the learning process.

The trainer should bring out the best in people, helping learners to identify needs and improve their skills and attitudes

	METHOD	DEFINITION	ADVANTAGES	DISADVANTAGES
1.	Presentation.	Trainer presents information to learners using a variety of aids.	Trainer controls time. Good for larger groups. Consistent information provided.	Without active participation, attention span of learners is limited and it is difficult to evaluate effectiveness.
2.	Case Study/ Exercise.	Information supplied about a real situation. Problem solving in groups, including presentation of conclusions.	Learners are actively involved. Evaluation of performance is relatively easy, provided briefing is clear.	May not be relevant to learner's job. Takes time to complete and cannot be rushed.
3.	Small Group Discussion.	Learners discuss a topic and draw conclusions.	Stimulates interest because all learners are involved. Chance to pool ideas and share knowledge.	Needs good leadership to be effective.
4.	Demonstration/ Instruction.	Learners are shown a piece of equipment or a model of the plant and given a correctly completed procedure.	Helps to crystallise theoretical knowledge by observation of a practical application. Visual interest.	May not be relevant to everyone. Not good for large groups.
5.	Reading.	New information is received by learners through written material.	All learners get same material that can be used later. Can save time. Good change of pace if previous session was too active.	May not be best use of time during a training session. Different people read at a different pace.
6.	Feedback and Application.	Learners evaluate materials and describe how they will apply them to their own job situations.	Active learner involvement. Listening to other learners is stimulating. Good gauge of training sessions' effectiveness.	Needs time for preparation and presentation. requires strict control by trainer to ensure that everyone participates.

The type of method selected will depend on a number of factors including:

- complexity of material;
- objectives;
- past experience of the learners;
- size of group;
- number of trainers available;
- amount of written information available, including course manuals;
- time limitations;
- physical limitations of the training environment.

By exploring the training needs of your organisation, you can establish the most suitable method of training for your organisation. The training needs analysis is the same for whichever type of training method is chosen.

Step 5 - Conducting the training

How the training is conducted will depend on a variety of factors, including the delegates' background, the aims of the course, materials and methods. The trainer's preferred style also has an impact.

The 'Training Delivery Check-list' given in Chapter 5 (Page 30) provides a detailed summary of the important factors to consider when conducting training. While this check-list covers material that is familiar to experienced trainers, it will act as a guide for energy management staff embarking on their own training programme for the first time.



Step 6 - Evaluating the learning

Evaluating training is an important, but sometimes difficult, task.

Although evaluation takes time, money and some effort, it is necessary to analyse whether the training initiative was worthwhile. Evaluation tells the energy user if the training is an effective part of an on-going energy strategy and whether it achieved its objectives. This must include a reduction in energy consumption and costs. Evaluation should also indicate whether there is a better way of achieving the required result. Finally, evaluation gives the trainer a measure of his/her performance in the design and delivery of the training programme.

Suggested areas for evaluation are:

- What was the learners' opinion of the training they received? What did they find useful in terms of the content and methods employed? Did they feel it was relevant to their particular jobs?
- Were the course objectives met? Did the learners actually learn what was targeted?
- Did the learners put the lessons learned into practice in their daily work?
- What impact did changed behaviour have on the energy consumption and costs of the learners' department, plant or section?

Evaluation methods

There is a wide variety of tools for evaluating training effectiveness. All have their positive and negative aspects; some are quantitative and others are not.

- **Course evaluation sheets**

These can be completed by learners at the end of the course to provide feedback on what they thought of the training they had received. It is best to keep such sheets short and to the point. The design is also important. Some people prefer boxes to tick in such circumstances. However, open questions where learners use their own words, tend to give more useful information e.g. 'Which parts of the course were least useful in your particular job?'

Course evaluation sheets have received some criticism in the training world, having been branded 'happiness sheets' because they are often completed in a state of euphoria at the end of the course. Some believe that they do not give an accurate impression of what will happen back at the work-place, when feelings have subsided. Some people advocate that one way of avoiding this problem is to get the learners to complete the evaluation sheets a few days after they complete the course and when they have returned to work. The danger of this approach is that some learners will forget or not bother to fill in the sheet. It is difficult to detect trends without a full set of completed sheets. It has to be said, however, that some feedback from delegates is better than nothing. An experienced trainer should be able to take the 'happiness' factor into account. The real test is how the data is used in future courses and in identifying trends by looking at a number of sheets.



- **Action plans**

There is much benefit to be derived from allowing sufficient time for delegates to complete an action plan 'towards the end of a course. The questions to answer should be specific e.g. 'List six practical measures you will take to save energy in your department.' Once everyone has completed the action plan, each learner could be asked to give a short three minute presentation on what they plan to do as a result of attending the course. The trainer can affirm and also question some of the statements; again this helps to translate the content to the work-place.

This method has also been criticised on the grounds that the learner is only saying what he/she is going to do. At the end of the day, the important question is: 'What have they actually done?' However, this question will not be answered until sometime after the training is completed.

However, experience shows that a learner is far more likely to make an effort to carry things through if that person has:

- thought about the relevance of the training content to their job;
- written down a practical action plan of measures to be taken;
- verbalised these plans to 12 or more others and received some critical feedback and affirmation.

It is vital that this session is not rushed. The quality of the learners' action plans should also tell the trainer how much learning has taken place.

- **Tests and examinations**

These can provide quantitative feedback on what the learners have derived from the course. Such tests are often in a multiple-choice format, which makes them easier to mark and evaluate.

Tests and examinations can be useful, provided that they are designed properly. Written examinations, which can take up valuable training time, are generally confined to more theoretical courses. While knowledge is easily tested by this method, skills and attitudes do not lend themselves to this type of testing.

- **Observation by managers**

Provided that managers are fully briefed, they can observe behaviour and attitudes back in the work-place. It can be discouraging to learners to return to their jobs only to discover that their managers are apathetic to saving energy.

Managers who have been involved in the training process will want the learner to report back on what he/she has learnt and the relevance of the training to the business objectives of the department/section. The manager can then encourage the learner to apply the lessons and empower the learner to take new initiatives to save energy. Performance targets for energy reduction can also be discussed and methods for achieving them agreed. After the training, positive support from line management is vital to encourage people to make things happen.

The manager can observe and, hopefully, measure progress. In addition, the manager is the one most likely to observe and benefit from the training received by his staff, and therefore has a vested interest in evaluating its effectiveness.

- **Energy Monitoring and Targeting**

One of the biggest difficulties for many trainers is to derive a 'before and after' quantitative measure of the success of a training intervention e.g. If everyone in an organisation receives training in 'Customer Care', it is likely to improve business. But by how much? Was it worth the investment? Is it possible to carry out a detailed cost/benefit analysis of the training? What would have happened if the training had not taken place? These are nightmare questions for a Training Manager, because they are usually unanswerable. No one knows. It is an act of faith. Training is likely to be beneficial, but no-one knows for sure because it cannot be measured.

In contrast, energy management training should be able to deliver a quantitative measure of success provided that an energy monitoring and targeting system is installed.

An energy monitoring system will submeter energy consumption to distinct cost centres, known as Energy Account Centres. This system should be able to identify reducing energy consumption trends as a result of the training. Obviously if other initiatives are taking place, e.g. an insulation project, then these measures must be taken into account.

One application of this useful tool is to run a pilot energy training course for staff from a selected building process or section that is a submetered Energy Account Centre. By monitoring the results of training, decision makers can then decide if they want to extend the training to cover all cost centres throughout the organisation.

Lessons learned from the pilot course can also be applied to the extended programme.

There can be few areas of training which can be measured so effectively. Good examples appear in the case studies in Chapter 6 (Page 36).

Training initiatives may or may not be effective, but unless there is some method of measuring effectiveness no one will know for sure if it has been worthwhile.

4

SELECTING AND USING EXTERNAL TRAINING PROVIDERS

Why use an external training provider?

While some larger organisations use in-house staff to run regular energy training programmes, the trend is towards contracting out energy training to external providers. The main reasons for this are:

- **Lack of staff resources**

Organisations of all sizes are having to reduce staffing levels. Even if they possess the internal ability to organise, plan and deliver energy management courses, they often do not have the time to do so.

- **Lack of expertise**

Some organisations do not possess the necessary in-house energy training skills. Good energy managers are not necessarily good trainers, communicators or motivators. Good technical trainers may not have the necessary knowledge of energy management.

- **External providers act as agents of change**

Since each organisation has its own culture, outsiders can sometimes be more effective agents of change than in-house trainers.

Trainers should have experience of energy management, be good communicators and be people oriented.

The two vital skills required to deliver energy management training are:

1. **Technical expertise**

The trainer needs to know about energy management from personal experience. If not, then the trainer will lack credibility in the eyes of the learners.

2. **Communication expertise**

The trainer must be a good communicator, who can relate to people. Technical ability is not enough. Trainers have to be people oriented if they are to succeed, because many of the barriers to change in energy management are 'people' issues and not purely technical ones.



Which external training provider?

Probably the best way of selecting a training provider is to ask other organisations for their views and opinions. A personal recommendation from another user can give a great deal of confidence.

Having drawn up a short list of potential trainers, it is worth inviting them to your organisation to assess their background, experience and suitability for yourself.

When interviewing likely candidates, questions should cover:

- ? Background and experience. Number of staff and offices? International experience (if relevant)? Professional indemnity.
- ? Specific energy management experience. Typical clients.
- ? Specific energy training experience. Typical clients. Size of previous training contracts. References from satisfied clients.
- ? Scope of services.
- ? What is their training strategy/philosophy for bringing about change?
- ? Who exactly would deliver the training? What is their experience and qualification level?
- ? Views on numbers to be trained.
- ? Typical fees.

Examples of documentation from previous training assignments can also be useful when selecting an external training provider.

Advice on how to select an external trainer is given in the booklet 'Choosing an Energy Efficiency Consultant', published by the Energy Efficiency Office (see Appendix A) and Appendix B lists some external training providers.

Proposals from external training providers

Before making a final decision, it is important to obtain a written statement of the scope of services, costs and proposed training programmes. The training user can either issue a detailed specification against which tenders are offered or simply ask the provider for a written proposal.

The proposal, which should be a 'stand-alone' document, will typically include:

- Introduction and background.
- Aim and objectives of the proposed training.
- An explanation of how the training will help to achieve the overall energy strategy.
- The scope of services on offer e.g. training needs analysis, course design, manual production, course delivery, follow-up work, etc.
- CVs of proposed trainers.
- Training methods, style and philosophy.
- Who is to be trained? Numbers per course.
- Location of training venue.
- Programme dates.
- Costs and terms of business.
- List of recent relevant energy training assignments.
- Relevant background information on company capabilities and broader experience in energy management.



Some organisations prefer prospective training providers to give a presentation to senior management. This achieves two things:

1. The presentation will hopefully stimulate top down commitment from senior management to the proposed programme.
2. The presentation by the training organisation will give an indication of their training capabilities, particularly if the person delivering the presentation is the person who will be actually delivering the proposed training.

The ‘Train the Trainer’ approach

Some organisations design and deliver all their own energy training programmes, while others leave this to an external training provider. However, there is an option which combines these two approaches. Here, the external training provider designs a training package and develops all the course materials, manuals and visual aids. The external trainer then delivers the first one or two courses, while simultaneously training the user organisation’s trainer to delivery the package. In addition, the training provider usually produces a ‘Trainer’s Manual’.

These types of packages require considerable effort by the external training provider and, therefore, can be expensive to develop. The ‘train the trainer’ approach should always be carefully costed. It is usually only cost effective when the user wishes to train large numbers of staff and the course has to be repeated many times. Before commissioning an external training provider to produce such a package, it is important to check that they have experience in producing ‘train the trainer’ packages and the necessary coaching skills.

5

TRAINING DELIVERY CHECK-LIST

The training venue

The training venue, which might be the company training room or a conference room in a hotel, should be suited to the needs of the learners.

It is usually most cost effective to run courses on-site using the company's training facilities. However, there are times when it is advantageous to run the courses off-site at a hotel. A hotel may provide a geographically sensible location for busy managers from different sites. They are also less likely to be interrupted during a training session for crisis management because they are away from the site. It is also useful to disconnect the telephones in the training room and ask for messages to be relayed at the next break.

Residential courses can be useful because a lot of informal discussion occurs outside the training room. Learners acquire much useful information from their peers in a relaxed environment.

Before the training begins it is important to check the venue's facilities:

- **Layout**

For 12 - 15 learners, a 'U' shape is usually the best arrangement, so that everyone can see each other and the trainer. Check there is enough working space between each learner.

- **Lighting**

Check which switches/dimmers control the lights;

- **Ventilation/Heating**

Is there natural ventilation, air handling units or full air conditioning? Where are the controls? Is the air conditioning noisy? Do you want the heating on? Remember 15 people soon create a lot of heat;

- **Noise**

If opening windows for ventilation, check for noise from traffic, hotel kitchens, plant machinery, etc;

- **Visual Aids**

Does everything function - OHP, screen, video, flipchart, slide projector, etc? Can everyone see properly?

- **Other Areas**

A no smoking policy should be considered, and the location of the nearest toilets and syndicate rooms (if required) checked beforehand. Use a marker pen to write clear name cards with learners' first and last names - it helps everyone to know the identity of the other delegates.

The trainer should check all these points well before the learners arrive, so that he/she can give trainees his/her full attention when they arrive.

Numbers for training

The number of people who should attend a training session is determined by the aim of the session. It is possible to have 100 delegates at a session where it is simply the aim to get information over, however, such a large group makes interaction virtually impossible. For proper training to take place, the group must be small enough to guarantee a good level of unhindered interaction but it must be large enough to enable a variety of training methods, such as small group discussions, to be used.

The best size is probably between 8 and 14 learners. Above 14, the size of group discourages quieter delegates from participating fully and when it comes to presentations, there are time constraints if everyone is to participate. At the other end of the scale, group dynamics can be difficult to sustain with a small group of three or four learners. For this small number, the trainer has to consider his/her approach carefully.

The size of the group must be such that there is a good level of unhindered interaction while still allowing use of a variety of training methods, e.g. group activities.

Timetables

A good trainer will have a plan, with times for each session and a clear idea of training content, methods and visual aids.

Should this programme, including detailed timings, be given to the learners? This has the advantage of giving learners a clear statement of what to expect. But the disadvantage is that it puts pressure on the trainer to keep rigidly to the timetable.

In reality, what often causes programmes to fall behind the stated times is questions and interaction from the learners. If the discussion is relevant then there is an argument for the trainer to 'go with flow' on this subject, and make up time by cutting out or reducing content elsewhere. By not publishing the detailed programme, trainers allow themselves flexibility. The best solution is to publish times for starting and finishing and breaks for lunch, tea and coffee. The trainer can explain the ground to be covered at the start of the day, but without committing himself/herself to a strict timetable.

Aim to start and finish sessions on time. It is useful to avoid passive sessions immediately after lunch. This session should be as participative as possible, because it is usually the period when learners are the least alert. Conversely, sessions requiring high levels of attention and covering major new ground should be tackled first thing in the morning.

Avoid passive sessions after lunch - make them as participative as possible.

Briefing the learners

Experience shows that no matter how well the training is designed or delivered it will only be effective if the learners arrive for the training in the right frame of mind. It is important that delegates arrive well briefed and understanding something about the course. The best approach is for the line manager to brief learners verbally about the course, explaining why they are attending and what will be expected of them as a result of the training.

Delegates must be well briefed about the course so that they arrive in the right frame of mind.

If the administration of the training is handled badly, the trainer has the task of first overcoming resistance to the training. If the training only lasts half a day or one day, this resistance can become a dominant theme and effectively undermine the entire training course. Having said this, an experienced trainer will pick up problems within the first ten minutes of a training course by paying attention to communications, both verbal and non verbal, and to feedback from learners.

One useful tool is an 'Issues' chart. This involves the trainer using a page on a flipchart to record any issues that the learners raise. While these issues may or may not relate to the training content, they are important to the learners. By writing the issue on the flipchart, the trainer is demonstrating that he/she has listened to the learner and that this information will be conveyed to the relevant managers after the course.





Opening session

It is important to begin a training session as you intend to go on. Learners' attention must be captured at the very beginning. Learners must also realise straight away that the training will be participative and that they will be expected to contribute. After welcoming delegates, it is useful to get them to briefly introduce themselves following a simple format written on a flipchart.

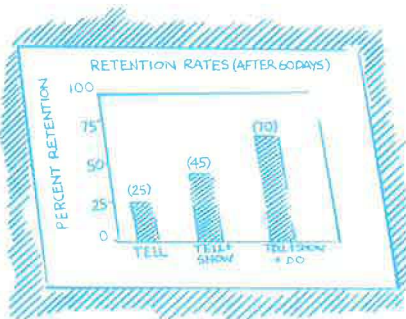
Many people who attend energy training courses are not full-time energy managers. Many private and public sector managers have energy management responsibilities, but these often only represent 5 - 10% of their job. At the beginning of a training session for this kind of group, the following information should be requested:

- Name and role in organisation.
- Location.
- Years of experience in energy management.
- Percentage of job devoted to energy management.
- One current major issue they are facing in energy management.

Such introductions break the ice. It is also helpful for other delegates to know who else is attending. The trainer can ask clarifying questions and set a comfortable atmosphere. It is important that the trainer keeps control, limiting each learner to 60 seconds, otherwise the introductions can go on for too long.

Using visual aids

Recent research shows that people remember significantly more of what they both see and hear, rather than that which they simply hear. Visual aids are extremely valuable tools because they can help to clarify a complex idea or to communicate an involved process in a simple and memorable manner. A chart or graph can instantly clarify and emphasise trends, proportions and relationships, whereas columns of figures leave the average person totally confused. It should be noted, however, that a visual aid is counter-productive if it is not relevant to the point being made.



An enormous range of visual aids is now available. Hand-outs, flipcharts, 35 mm slides, overhead projectors, models, whiteboards, blackboards, videos, etc all have their place. Use of slides and videos in particular are covered in greater detail later in this chapter. There are, however, a few basic principles that will ensure that you make the best of whatever medium you choose.

When preparing your visuals:

- **Keep it simple**
Generally, you should aim to communicate only one idea with each visual. Any information that is not needed to make your point should be removed or covered up.
- **Use as few words as possible**
Remember, they are visual aids not verbal ones. Too many words on a slide or transparency will significantly weaken its impact and effectiveness.
- **Don't give too much information all at once**
If your diagram/illustration contains a lot of different points, it is best to reveal them one at a time until a composite picture is built up. This way listeners are able to assimilate the information more easily.

When using your visuals:

- **Ensure they can be seen clearly**

You will need to try out your visual aids - at the venue if possible - beforehand. Walk around the room to check that everyone can see and read what is presented. If you find that certain items cannot be read clearly, you will know when you need to explain what is depicted, rather than just letting the visual speak for itself.

- **Check the equipment**

Before your presentation, check that all the equipment is in good working order and that you are completely comfortable with how it operates.

- **Rehearse using them**

Practice with the visual aids before the presentation will increase confidence, will save you time during the presentation and give a more professional feel to the presentation. An important point to consider is where you should stand when using an OHP. A common mistake is to look and speak at the screen, causing an immediate loss of contact with the audience. There are two ways of resolving this problem. One is to stand alongside the screen with your body facing the audience, occasionally glancing at the screen. Another solution is to stand beside the OHP and glance at the original on the OHP, thus facing the audience with your back to the screen. If you wish to point to something on the screen, simply place a pencil on the acetate film. With the latter method, it is important to make sure you are not blocking anyone's view.

The use of slides in energy training

35 mm colour slides can be very useful when making a presentation to a large group of people. Information can be displayed easily and clearly, resulting in a professional presentation.

Slides should be used with care in smaller training sessions. In a slide presentation, attention is focused on the screen and on the presenter, making participation or questions difficult. It is also customary to dim the lights and this can encourage some members of the audience to doze! Try to avoid using a room that cannot be darkened satisfactorily on a sunny day.

The use of videos in energy training

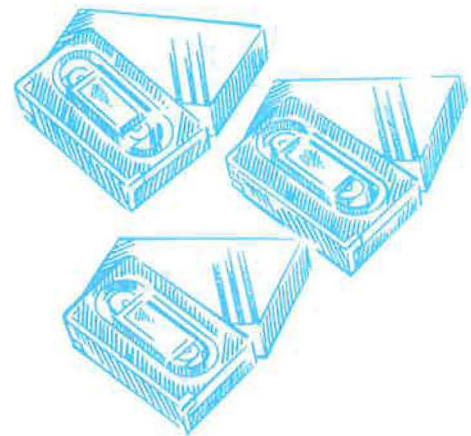
A video can be a very effective form of communication. It can be used to:

- introduce a subject;
- summarise a session;
- reinforce key points;
- provide a change of pace.

It is easy, however, to misuse videos in any form of training. The video should be introduced positively, so that delegates' expectations are raised. It is easy for delegates to watch videos in a passive manner and miss important points. This problem can be overcome by asking several questions relevant to the video before it is shown and telling delegates that these questions will be discussed afterwards.

Energy efficiency videos are typically between 8 and 25 minutes in length. One approach is to show the video in its entirety and then show it again in sections, pausing to discuss the main points. Another approach is to use parts of the video to emphasise important points.

Immediately after the video has ended, it is important to encourage feedback and to discuss the essential points. It is particularly important to help the delegates understand how the points made in the video can be applied in their daily work situations.



Sources of energy efficiency videos

There are five main sources of energy efficiency videos:

1. The 'Managing Energy' video and film series produced by the EEO.
2. Videos produced by the EEO as part of its Best Practice programme.
3. Videos made by a trade association or professional body.
4. Videos produced by energy supply companies.
5. Tailor-made videos commissioned by your organisation.

EEO 'Managing Energy' videos and Films

The 'Managing Energy' videos and films produced by the EEO are intended to help energy managers foster an attitude of greater care in energy use within their organisations. Extensive use is made of 'live action' and animation to explain the principles of the design and energy efficient operation of plant and equipment. Each video is accompanied by literature for delegates' hand-outs. Details on the subjects covered and how to obtain copies can be found in Appendix A.

EEO Best Practice programme videos

The EEO has recently produced a series of videos as part of its Best Practice programme, an initiative aimed at advancing and disseminating impartial information to help improve energy efficiency. The videos are intended to update managers and staff in a wide range of companies on the latest energy efficient methods and technologies. Further details on how to obtain copies can be found in Appendix A.

Videos from a trade association or professional body

If your organisation is a member of a trade association or a professional body, it is worth enquiring whether they have produced a video on energy efficiency that is geared to your industry. Such a video could provide a more tailored approach without the cost of paying for your own tailor-made video.

Videos produced by energy supply companies

Some energy supply companies produce videos which can be purchased or hired by customers.

For more information contact your local energy supplier or, for British Gas, Shell or Nuclear Electric videos contact:

Viscom Ltd, Unit B11 Park Hall Trading Estate, London SE21 8EL.
Tel: 081 761 3035

Tailor-made videos

The advantages of commissioning your own video are that the video will be geared up to your own organisation, it will be tailored to identified training needs and if there are a large number of staff to be trained, everyone will receive the same information.

Some companies are tempted to make their own videos. The result is usually disappointing.

If you are planning to have a video made, then have it done professionally by a good company. A useful starting point is:

The International Visual Communications Association (IVCA),
102 Great Russell Street, London WC1E 3LN
Tel: 071 580 0962

The IVCA, which is a non-profitmaking organisation, provides lists of its members, who all subscribe to a professional Code of Practice. The Association also produces useful literature on how to commission videos, how to deal with production companies, advice on budgets and likely costs. One of their booklets, entitled 'Commissioning a Programme', includes a draft agreement for use by producer and client and a helpful glossary of terms used in the film industry. A check-list of various costs and likely fees is also provided.

EEO videos produced as part of the Best Practice programme comprise:

- 1 Best Practice - An Overview
- 2 Management Techniques for Energy Efficiency
- 3 Monitoring and Targeting
- 4 Low Temperature Heat Recovery
- 5 High Temperature Heat Recovery
- 6 Compressing Air Costs
- 7 Small-Scale Combined Heat and Power
- 8 Industrial Combined Heat and Power
- 9 Cast Iron Savings
- 10 Making Motors Pay Dividends
(Information pack)

Tailor-made videos are an expensive option and alternative options should be fully considered before any decision is taken.

A tailor-made video is an expensive option. The cost is determined by the number of locations and actors used, and the scope and complexity of the brief. A cheaper option is to get a professional photographer to take, say 200, coloured slides of energy use in your organisation. You can then write a script to go with these pictures. A specialist production company can take your written script and use an actor to record the message. The resulting video will consist of stills with music and titles and should cost considerably less.

When writing a script for an energy efficiency video, it is important to remember that the aim of the video is to raise the awareness and motivation of employees. One danger is to concentrate on examples of success of good practice within the organisation, while omitting any past difficulties or failures. This can undermine the whole message of the video and can have a negative impact. It is important to acknowledge problems as well as successes.

Once the video has been shown, monitor delegates' reactions to provide feedback for any future videos.

It is important that energy efficiency videos have a balanced approach, siting problems and failures as well as successes.

Concluding session

It is useful to allow time at the end of a course for a personal evaluation period, when learners can write down the ideas they wish to apply in their daily jobs. It is then beneficial for each learner to give a short three minute presentation to the rest of the delegates. It is important not to rush this session and to allow plenty of time for discussion.

At the end of a course, it is worth setting aside five to ten minutes for each learner to complete a one page course evaluation form. This provides invaluable feedback for future training sessions.



6

CASE STUDIES

Case Study 1: HIP Ltd

HIP Ltd is a small specialist company in Chesterfield offering a wide range of hot isostatic pressing services to the european automotive and aerospace industry. Nearly 80% of the site's electricity is used in isostatic processes.

The Works Manager attended a one week residential training course on electrical energy management. One major lesson was the importance of fully understanding all parts of electricity invoices. This led to action to reduce costs by improved product scheduling, better load management and a reduction in maximum demand and availability charges. The result was an annual cost saving of £5,300 by No Cost measures; the training course fee was recovered in less than four weeks. The savings were invested in power factor correction equipment that led, in turn, to more savings. Skylights were installed to make greater use of natural light.

Total investment costs were recovered in less than 12 months and the measures resulted in a 22% reduction in annual energy costs. HIP Ltd was able to reduce costs to customers, yielding an increase in its market share and a large increase in employee productivity.

Savings achieved by No Cost measures recovered the cost of the training course in less than four weeks. Savings were passed on to the customer, increasing HIP Ltd's market share.



HIP Ltd

For further details see Good Practice Case Study No 71 - 'Energy Management Training Enables Savings in Small Firms'.

Case Study 2 : British Aerospace (Airbus) Ltd

At its 700 acre site at Filton near Bristol, British Aerospace (BAe) manufactures aircraft and aircraft components, notably the BAe 146 and Airbus wings. Many light engineering activities are undertaken at the site, including machining, heat treatment, bonding and assembly.

An energy awareness training programme was started, aimed at 140 middle managers. The programme was monitored both to assess its effect and to identify lessons that could be applied to future training initiatives. Several energy conservation and cost saving measures were identified and implemented.

Some areas of the site achieved savings of up to 15% or more, if production changes are taken into account. These savings were achieved with just the investment in the training fee of £7,000, just under £50 per delegate. Post training monitoring indicated a saving of approximately 3% in the total site energy bill, which alone is worth £100,000/year. The payback on the training fees was approximately three weeks.

The Case Study concludes that training initiatives can be coupled with energy monitoring and targeting systems that allocate usage on a cost centre basis to clarify responsibility for energy management. Training should be viewed as one part of an integrated energy management programme rather than a stand-alone initiative, and to make the training effective, the message conveyed should be simple, stimulating and directly relevant to delegates' working environments.

The total site energy bill was reduced by around 3%, worth £100,000/year. Training fees were recovered in approximately three weeks.



British Aerospace

For further details, see Good Practice Case Study No 111 - 'Energy Management Training Programme'.

Case Study No. 3: ICI Fine Chemicals

ICI Fine Chemicals (now Zeneca Pharmaceuticals) at Grangemouth performs a variety of complex chemical syntheses for other ICI businesses. Following the publication of ICI's corporate environmental policy, the site decided to adopt a management-led approach to energy. This involved the appointment and training of a full-time energy manager, followed by the establishment of a team of 12 part-time resource co-ordinators. A training programme for the co-ordinators was then implemented. The programme has also involved other staff time, as well as auditing and performance monitoring.

The role of the site's energy manager in acting as the energy 'champion' and in providing training and support to the co-ordinators has been central to the project's success. The project cost £100,000, with £2,000 for direct training. Savings in excess of £500,000/year have been achieved, giving a payback period of less than ten weeks. The programme's cost was related to the size and complexity of the site; while training costs constituted a relatively small part of the overall cost, the training element was central to project's success. Critical factors from this successful project are applicable at many other sites.

Savings in excess of £500,000/year have been achieved. Payback of less than ten weeks was achieved on the project costs, with training costs being recovered in under one week.



ICI Fine Chemicals

For further details, see Good Practice Case Study No 165 - 'Energy Management in a Multi Process Site'.

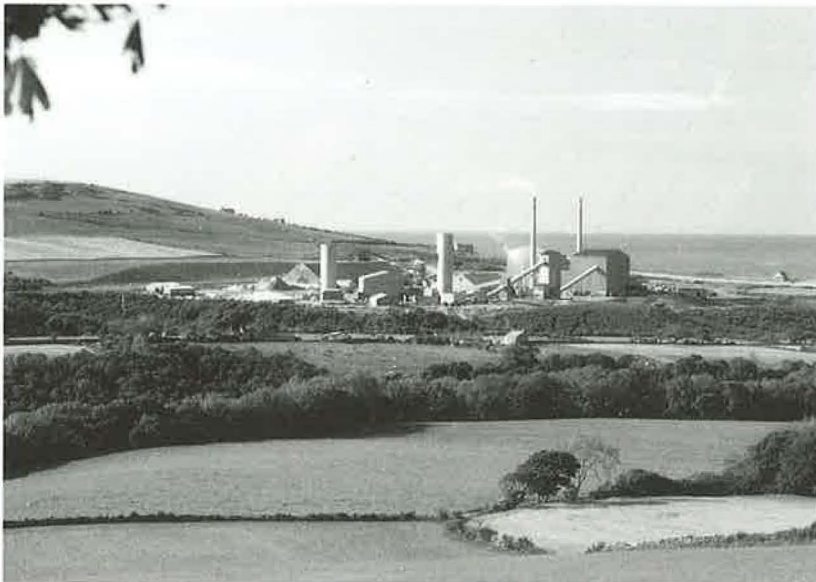
Case Study No. 4 : Cleveland Potash Ltd

Cleveland Potash Ltd, a wholly owned subsidiary of Anglo American, is the UK's only producer of potassium chloride. The appointment of an Energy Manager and a combination of load management techniques, training, good housekeeping measures and some minor investment led to energy savings of £325,000 in a 12 month period. A further £50,000 was saved by using load shedding techniques to avoid Triad charges under a pool contract. Energy consumption per tonne of saleable product fell by 11.6% and the energy cost per tonne by 7.4%.

A key factor was the commitment of senior management to flexible production schedules that allowed load shedding. Increased awareness among the work-force resulted initially from changed work patterns and procedures, but was followed up by training, which included :

- one day energy management seminar for senior managers and production managers;
- electricity supply, purchase and load shedding seminar with speakers from the electricity supply industry for the entire management team;
- two day courses on 'Boiler House Management' for boiler and drier operators;
- seminars by the oil supplier on the storage, handling and combustion of heavy fuel oil;
- on-site training for process operators by a steam equipment supplier.

Since the appointment of an Energy Manager, savings of over £375,000/year have been achieved. The principles used to achieve these savings can easily be applied at other industrial sites.



Cleveland Potash

For further details see Good Practice Case Study No 163 - 'A Co-ordinated Approach to Energy Management'.

Case Study No. 5: Rover Group Ltd

The Rover Group is the UK motor industry's largest manufacturer and biggest exporter. In June 1991, the Rover Group started a new energy cost saving programme at its Longbridge works, with the aim of saving £1 million without capital investment. Awareness at all employee levels was raised by:

- the formation of a site energy group led by the Manufacturing Engineering Director, which represented all business areas on the site and included site engineering and energy specialists;
- a publicity campaign;
- a competition;
- performance reporting against targets;
- using existing means of communication.

The most significant cost, £7,200, was the publication of a six page energy newsletter that was circulated to over 16,000 employees. No additional manpower was needed and no production was lost during the programme's implementation. The target savings were achieved in six months by improvements in energy housekeeping, rescheduling operations, resetting controls and minor process modifications. The programme is on-going and further savings are being realised.

Savings of over £1 million were achieved in six months by implementing No Cost saving measures.



Rover Group Ltd - Longbridge Site

For further details see Good Practice Case Study No 214 - 'Energy Saved by Raising Employees' Awareness'.

Case Study No. 6: Royal Borough of Kingston upon Thames

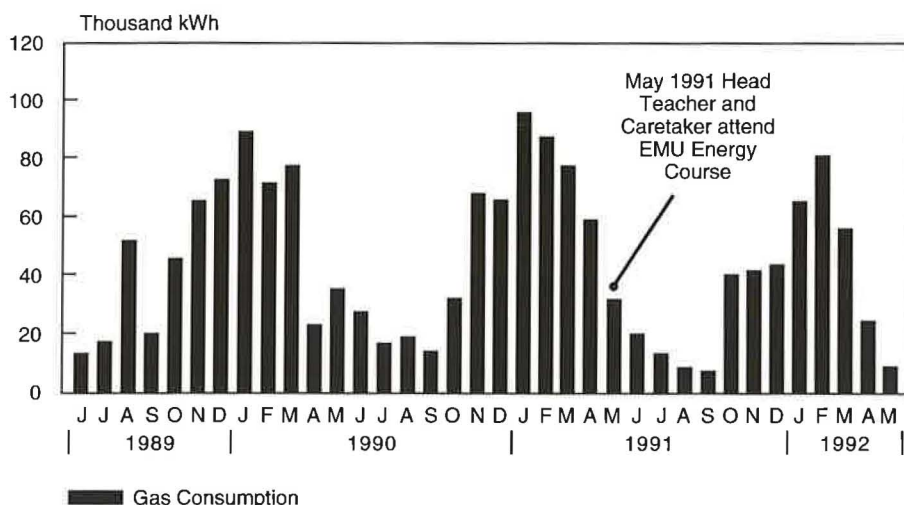
For a number of years the Royal Borough of Kingston upon Thames has taken a proactive approach to energy management.

A dedicated Energy Management Unit was established in 1987. Between 1987 and 1992, savings of over £830,000 were achieved by monitoring, improved purchase strategy, good housekeeping measures and a concerted investment programme.

In 1990 energy audits and surveys were carried out in a number of schools in the Borough, which provided the basis for targeting low cost investment projects. The studies also identified the potential savings which could be achieved by raising awareness of the effectiveness of good housekeeping measures amongst school head teachers and caretakers.

The Energy Management Unit ran a series of one day energy management seminars during the summer of 1991. The first seminar was aimed at both head teachers and school managers, discussing the basics of energy management. A follow-up course was held for school managers only, which focused on the management aspects of energy management. The training has proved to be very effective, resulting in significant savings at schools whose staff attended. The graph below shows the results for one such primary school, where gas consumption was reduced by 31% after staff attended the seminars and simply implemented the saving initiatives suggested.

The Energy Management Unit continues to be active, issuing a quarterly newsletter reporting on new energy efficiency measures and continued training available for industrial site managers, detailing case histories from the Borough and carrying motivational messages to readers.



Graph showing the effect of energy management training on gas consumption at a primary school in the Royal Borough of Kingston upon Thames



INFORMATION AVAILABLE FROM THE ENERGY EFFICIENCY OFFICE

Obtaining information and literature

Unless a different contact address is listed, all of the publications listed in this Appendix can be obtained free of charge (unless otherwise stated) from:

Department of the Environment, Blackhorse Road, London SE8 5JH

Please allow 28 days for delivery. Bulk orders are subject to examination and may be reduced according to availability of stock.

Information can also be obtained from Regional Energy Efficiency Offices (REEOs) - see Foreword for current addresses.

Information and guidance booklets

These publications provide practical summaries of fundamental energy efficiency topics:

1. Help from the Energy Efficiency Office
2. Training for Energy Efficiency
3. Monitoring and Targeting for Energy Efficiency

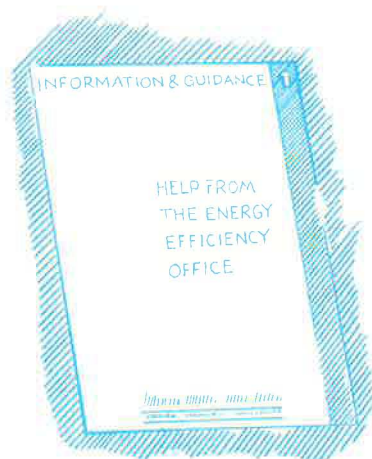
'Help from the Energy Efficiency Office' is an introductory booklet describing the range of programmes and publications available from the Energy Efficiency Office (EEO).

Energy Efficiency in Buildings series

These booklets explain how to compare your building's energy efficiency with similar types of buildings and contain action plans for improving its energy efficiency.

No.

1. Schools
2. Catering establishments
3. Shops
4. Health care buildings
5. Further and higher education buildings
7. Sports centres
8. Libraries, museums, art galleries and churches
9. Hotels
10. High street banks and agencies
11. Entertainment buildings
12. Courts, depots and emergency services
13. Factories and warehouses



Advice for local authorities

These booklets offer practical advice to local authorities on how to save energy.

1. Guidelines for Local Authority Shared Savings Energy Performance Contracts
2. Building on Success

Periodical

The EEO publishes the journal 'Energy Management' every other month, containing the latest energy efficiency news. The journal incorporates a supplement, called 'Focus', that highlights cost saving opportunities in particular sectors.

Fuel Efficiency Booklets

These booklets are useful hand-outs to illustrate particular technical subjects.

No.

1. Energy Audits for Industry
Energy Audits for Buildings
2. Steam
3. Economic Use of Fired Space Heaters for Industry and Commerce
4. Compressed Air and Energy Use
7. Degree Days
8. The Economic Thickness of Insulation for Hot Pipes
9. Economic Use of Electricity in Industry
Economic Use of Electricity in Buildings
10. Controls and Energy Savings
11. The Economic Use of Refrigeration Plant
12. Energy Management and Good Lighting Practices
14. Economic Use of Oil-fired Boiler Plant
15. Economic Use of Gas-fired Boiler Plant
16. Economic Thickness of Insulation for Existing Industrial Buildings
17. Economic Use of Coal-fired Boiler Plant
19. Process Plant Insulation and Fuel Efficiency
20. Energy Efficiency in Road Transport



Publications for domestic use

The following booklets have been produced as part of the Government's 'Helping the Earth Begins at Home' campaign:

- **Helping the Earth Begins at Home'**
A basic guide to energy saving measures for the home, including lighting, heating, cooking and running energy-using appliances.
- **'Insulating your Home'**
This booklet explains the importance of proper insulation and details the options available.
- **'Heating your Home'**
This booklet describes the options for heating your home, with costs of boilers and controllers fitted by a contractor on a DIY basis.

Best Practice programme publications

The Best Practice programme is a major EEO initiative which aims to help organisations in industry, commerce, the public sector and housing to become more efficient in their use of energy. Many publications have been produced under the Best Practice programme covering a wide range of topics.

For copies of Best Practice programme publications and other literature applicable to energy efficiency in industry, please contact:

Energy Efficiency Enquiries Bureau, ETSU, Harwell, Oxfordshire OX11 0RA
Tel: 0235 436747 Fax: 0235 432923

For copies of Best Practice programme publications and other literature applicable to energy efficiency in buildings, please contact:

Enquiries Bureau, BRECSU (Buildings Research Energy Conservation Support Unit), Building Research Establishment, Garston, Watford WD2 7JR
Tel: 0923 664258 Fax: 0923 664787

Other publications

The EEO's other relevant publications include:

- 'Energy Efficiency Office - an Introductory Guide'
This outlines the EEO's work and functions.
- Energy Efficiency Series
A range of important studies and reports available for purchase from HMSO.
- 'Energy Efficiency in Commerce and Industry'
A leaflet detailing sources of advice, information and practical help for industrial and commercial premises.
- 'Handy Hints in Offices'
A leaflet containing advice on how to use energy efficiently in the office.
- A range of free posters and stickers for offices and factories to encourage staff to save energy.



'Managing Energy' Films and Videos from the EEO

The 'Managing Energy' videos and films are intended to help energy managers encourage greater care in energy use within their organisations. Each title is available on video or in 16 mm film format and is accompanied by literature for delegates' hand-outs.

A complete training package containing a 15 minute video and notes on how organisations, both small and large, can become more energy efficient. Particularly useful in training programmes aimed at increasing staff awareness to save energy by No Cost and Low Cost measures.

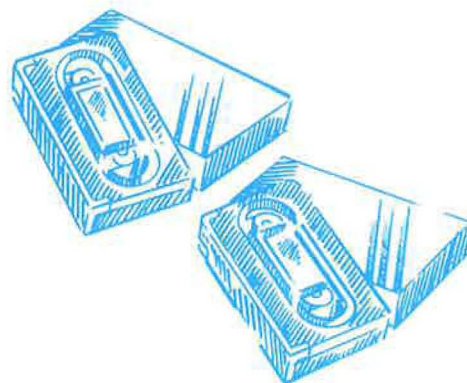
The 'Managing Energy' videos and films can be borrowed free of charge from CFL Vision by writing to:

CFL Vision, PO Box 35, Wetherby, W Yorks LS23 7EX. Tel: 0937 541010

Fourteen days notice is usually required.

Some of the videos were produced in the 1970s and 1980s, while others were produced more recently. It is recommended that a video's suitability is assessed prior to its use during a training course.

Ref No.	Title	Comments
UK2825	Oil and Gas Fired Furnaces	Aimed at furnacemen and foundry foremen
UK6185	Burners for Boilers	Aimed at boiler operators, maintenance foremen and maintenance engineers
UK2827	Factory heating and ventilation	Aimed at project and works managers
UK2849	Local Authority Buildings	Aimed at caretakers and building occupiers
UK6191	Pipe Insulation	
UK2851	Compressed air services	
UK6196	Exercise control	Examines ways of improving building control systems
UK2862	Burners for low temperature processes	Features application from the food industry, clay drying and petrochemical industry pre-heating. Plus waste heat recovery.
UK2909	Heat recovery	
UK6189	Insulation of industrial buildings	
UK298	Using coal	State-of-the-art approach to burning coal in small to medium sized shell boilers
UK6029	Electric motors	
UK6193	Refrigeration	
UK6187	Retail shops and stores	
UK6190	Local government buildings	Made in 1985
UK6192	Hotels	
UK6186	Small firms	Shows how good energy management can improve energy efficiency of small businesses and increase profit margins
UK6216	CHP gas and oil	
UK6230	CHP coal	For those with little knowledge of the technology as well as more experienced energy managers.
UK6268	Metering matters	
UK6194	Look at lighting	
UK6188	Steam	
UK2998	Energy for profit	Highlights the importance of efficient energy management in combating rising energy costs and the resultant lowering of profit margins.
UK4023	The Morning Smile	For sale only at £29.90



For further information on the videos and films and their contents, contact:

Energy Efficiency Office, Department of the Environment, 2 Marsham Street,
London SW1P 3EB

Best Practice programme Videos from the EEO

As part of its Best Practice programme, the EEO has recently produced a series of videos which are intended to update managers and staff in a wide range of businesses on the latest energy efficient methods and technologies and how to put them into action. The videos are particularly suited to in-house training sessions designed to raise employees' awareness of the importance of energy efficiency. The videos contain many case study examples, showing how the methods and technologies described have resulted in real cost savings for the organisations involved.

The video series comprises:

Number	Title
1	Best Practice - An Overview
2	Management Techniques for Energy Efficiency
3	Monitoring and Targeting
4	Low Temperature Heat Recovery
5	High Temperature Heat Recovery
6	Compressing Air Costs
7	Small-Scale Combined Heat and Power
8	Industrial Combined Heat and Power
9	Cast Iron Savings
10	Making Motors Pay Dividends

For further details on the videos and on how to order copies, contact:

Energy Efficiency Enquiries Bureau, ETSU, Harwell, Oxfordshire OX11 0RA
Tel: 0235 436747 Fax: 0235 432923



Further help from the Energy Efficiency Office

Energy Management Assistance Scheme (EMAS)

The Energy Management Assistance Scheme provides help with the cost of consultancy, for managing energy efficiency projects in small and medium-sized businesses with less than 500 employees. Up to 10% of the cost is offered for projects that appear to have a good chance of achieving energy savings of more than 10%. Financial assistance is provided in three stages:

1. 30% of the costs for identifying opportunities (50% if less than 50 staff);
2. 50% of the costs of specific project design;
3. 70% of the costs of project management.

When the project is complete, a further claim to bring the total grant up to 10% of the project's costs is possible.

Consultants

The EEO provides advice on how to go about finding a suitable consultant in a booklet entitled 'Choosing an Energy Efficiency Consultant'.

Practical Energy Saving Guide for Smaller Businesses

Although this helpful A4 sized booklet is targeted at smaller businesses, it is useful for any organisation approaching energy management for the first time.

For further information on any of the above please contact:

Energy Efficiency Office, Department of the Environment, 2 Marsham Street,
London SW1P 3EB



MAKING A CORPORATE COMMITMENT CAMPAIGN

A commitment to responsible energy management

In recent years, many UK companies have recognised the need to make a more positive commitment towards the effective management of energy. The EEO has launched a new initiative to encourage the senior management of all UK businesses to join this movement, and to make a corporate commitment at board level to responsible energy management.

The campaign

The Making a Corporate Commitment Campaign is led by the EEO of the Department of the Environment, and is supported by other government departments, particularly the Department of Trade and Industry (DTI) and the Department of Transport (DTp). The campaign was launched in October 1991 when a number of major UK companies made a corporate commitment to responsible energy management and became founding signatories. There is also formal support for the campaign from a number of business organisations including:

- CBI;
- Institute of Directors;
- Advisory Committee on Business and the Environment;
- Association for the Conservation of Energy.

The Declaration of Commitment

One feature of the campaign is the Declaration of Commitment, which the chairman or chief executive of a company can sign and display prominently at the company's headquarters. The Declaration of Commitment sets out the guiding principles behind an effective energy efficiency programme. The Declaration invites companies to:

- publish a corporate policy;
- establish an energy management responsibility structure;
- increase awareness of energy efficiency among employees;
- hold regular reviews;
- set performance improvement targets;
- monitor and evaluate performance levels;
- report performance changes and improvements.



MAKING A CORPORATE COMMITMENT

To obtain an information pack about the Making a Corporate Commitment Campaign contact:

Making a Corporate Commitment Campaign, Energy Efficiency Office,
Department of the Environment, 2 Marsham Street, London SW1P 3EB
Tel: 071 276 4615



DIRECTORY OF TRAINING PROVIDERS

This list is neither complete nor exhaustive, but contains the names of those who returned questionnaires in response to a mailing to known providers of energy training services. To appear in this Directory, each training provider had to demonstrate the provision of substantial amounts of training services to industry in the field of energy efficiency in the period 1987 - 1992.

Providers are listed in four main categories:

1. Independent Energy/Training Consultants.
2. Equipment Suppliers (*type of equipment is shown in italics*).
3. Professional Bodies or Industry Associations.
4. Academic Institutions (running short courses).

Some of these training providers also offer services to promote motivation to save energy.



Listing of a provider does not constitute an endorsement by the EEO of its competence and neither does non-listing of a provider discriminate against its competence. The list will be updated at each reprint.

Details of other consultants experienced in the provision of training and motivational services can be supplied by:

The Energy Systems Trade Association (ESTA)
Groveswood House
Over Butterow
Stroud
Gloucester
GL5 5BP

Tel: 0453 873568 Fax: 0453 872334

Independent energy/training consultants

Ashdown Energy

25 Claremont Hill, Shrewsbury SY1 1RD

Tel: 0743 272350

Contact: Mr R Godwin

Associates in Building Services

Axe and Bottle Court, 70 Newcomen Street, London SE1 1YT

Tel: 071 3780006

Contact: Mr A Carter

William Battle Associates

York Chambers, York Street, Swansea SA1 3NJ

Tel: 0792 459805

Contact: Mr P Jenner

Briar Associates

Mill Lane, Kinver, Stourbridge DY7 6LH

Tel: 0384 877766

Contact: Mr E Horgan

Bristol Energy Centre

101 and 109 Philip Street, Bedminster, Bristol BS3 4DR

Tel: 0272 662008

Contact: Mr A Cridge

British Steel Technical Swindon Laboratories

Moorgate, Rotherham S60 3AR

Tel: 0709 820166

Contact: Mr D F Hibbert, Manager, Fuel and Furnaces Department

Cheriton Technology Management Ltd

St. Stephen's House, St. Stephen's Place, Cambridge CB3 0JE

Tel: 0223 69190

Contact: Dr P Harris

Colledge Trundle and Hall

NESCOT Epsom Centre, Longmead Road, Epsom, Surrey KT19 9BH

Tel: 081 394 3287

Contact: Mr W Colledge, Partner

Energy Management Solutions

Newlands, Belmont Road, Stroud, Gloucestershire GL5 1HH

Tel: 0453 750250

Contact: Mr S Hough, Director

Enviro-Energy Management Associates

58 Trendlewood Park, Stapleton, Bristol BS16 1TT

Tel: 0272 658776

Contact: Mr D J Bradshaw

Dr S Fawkes, Energy Management Consultant

49 Coopers Gate, Southam Road, Banbury, Oxfordshire OX16 7EQ

Tel: 0295 273782

Martin R Fry and Associates

Bag End, The High Street, Hurley, Berks SL6 5NB

Tel: 0628 829959

Contact: Mr M R Fry

Denis Guy and Partners

Rowan Hill, Perrymead, Bath , BA2 5AY

Tel: 0225 834015

Contact: Mr D Guy

Mr S R Howe

31 Broadway, Finchfield, Wolverhampton WV3 9HG

Tel: 0902 755907

March Consulting Group

Telegraphic House, Waterfront 2000, Salford Quays, Manchester M5 2XW

Tel: 061 8723676

Contact: Mr I R Bailey, Director,

National Industrial Fuel Efficiency Service Ltd

NIFES Consulting Group

King Johns Arcade, 13 - 15 Bridlesmith Gate, Nottingham NG1 2GR

Tel: 0602 589047

Contact: Mr J Mulholland, Training Division Manager

The John Pooley Consultancy

6 Waterlaide Close, Hartlebury, Worcestershire DY11 7TS

Tel: 0299 250585

Contact: Mr J Pooley

TM Consulting Group

5 Charterhouse Square, London EC1M 6EE

Tel: 071 867 8600

Contact: Mr B Chamberlain, Managing Director

Vilnis Vesma

17 Church Street, Newent, Gloucestershire GL18 1PU

Tel: 0531 821350

Contact: Mr V Vesma, Principal

Mr J Williams

132 Sutherland Avenue, Biggin Hill, Westerham, Kent TN16 3HJ

Tel: 0959 572124

Equipment suppliers

Allen-Martin Conservation Ltd

Building Energy Management Systems

Vulcan House, Oxford Road, Bilston, West Midlands WV14 7LF

Tel: 0902 353136

Mr W Deakin, Training Manager

Di-Log Instruments, Hawk Energy Products

Mobile Energy Metering and Monitoring

8 Otterwood Square, Martland Mill Industrial Estate, Wigan, Lancs WN5 0LF

Tel: 0942 222657

Contact: Mr J K Anderson, Co-ordinator

Dunphy Combustion Ltd

Burners and Associated Controls

Queensway, Rochdale, Lancs OL11 2SL

Tel: 0706 49217

Contact: Mr M P Dunphy, Managing Director



Energy Technology and Control Ltd

Oxygen trim control for combustion plant

25 North Street, Lewes, East Sussex, BN7 2PE

Tel: 0273 480667

Contact: Mr C Talmay, Technical Director

Landis and Gyr Building Control (UK) Ltd

Building Energy Management Systems and general energy controls

2 Dukes Meadow, Millboard Road, Bourne End, Bucks, SL8 5XF

Tel: 0628 859140

Contact: Mr M Kean, Training Manager

NEI International Combustion Ltd

Boilers, burners and associated combustion equipment and controls

Cochran Boilers, Newbie Works, Annan, Dumfries & Galloway DG12 5QU

Tel: 0461 205511

Contact: Mr W Cowan, Product Training

Saacke Ltd

Burners and controls

Marshlands Spur, Farlington, Portsmouth PO6 1RX

Tel: 0705 383111

Contact: Mr E W Cutler, Training Officer

Satchwell Control Systems

Building Automation Systems and energy control equipment

PO Box 57, Slough, Berks SL1 4UH

Tel: 0753 550550

Contact: Mr S Forrest, Technical Training Manager

Sinergy Ltd

Mobile energy metering and monitoring

Station Road, Strines, Stockport SK12 3AQ

Tel: 0663 764883

Contact: Mr B Jones, Managing Director

Spirax Sarco Ltd

Components for steam/hot water systems and controls

Charlton House, Cheltenham, Gloucestershire GL53 8ER

Tel: 0242 521361

Contact: Mr A Bendall, Training Manager

Trend Control Systems Ltd

Building Energy Management Systems

PO Box 34, Horsham, West Sussex RH12 2YF

Tel: 0403 211888

Contact: Mr W Gough, Training Manager

Professional bodies or industry associations

British Institute of Management

Management House, Cottingham Road, Corby, Northamptonshire NN17 1TT
Tel: 0536 204222
Contact: Ms D Michelli, Head of Open Courses

Chartered Institution of Building Service Engineers

Delta House, 222 Balham High Road, London SW12 9BS
Tel: 081 6755211
Contact: Ms A Gibbons, Conference Organiser

Construction Industry Conference Centre Ltd

PO Box 6, Bicester, Oxfordshire OX6 4JN
Tel: 0869 40075
Contact: Mrs C Saunders

Institute of Energy

18 Devonshire Street, London W1N 2AU
Tel: 071 580 0077
Contact: Short Courses Secretary

Institution of Chemical Engineers

165 - 171 Railway Terrace, Rugby, Warwickshire CV21 3HQ
Tel: 0788 578214
Contact: Ms S Heales, Senior Continuing Education Officer

Mid Career College (in conjunction with Institute of Energy)

PO Box 20, Cambridge CB1 5DG
Tel: 0223 880016
Contact: Mrs A Chapman, Courses Secretary

OFTEC (Oil Firing Technical Association for the Petroleum Industry)

Century House, 100 High Street, Banstead, Surrey SM7 2NN
Tel: 0737 373311
Contact: Mr C M J Sutherland, Technical Adviser

Academic Institutions (running short courses)

Dept. of Applied Energy, School of Mechanical Engineering, Cranfield University

Bedford MK43 0AL
Tel: 0234 750111 ext 5335
Contact: Mrs B Hunt, Short Course Administrator

Department of Mechanical and Manufacturing Engineering, De Montfort University

The Gateway, Leicester LE1 9BH
Tel: 0533 551551
Contact: Dr P C Few, Principal Lecturer

Open Learning Training Services Unit, Gwent College

Allt-yr-yn Avenue, Newport, Gwent NP9 5XA
Tel: 0633 432387
Contact: Mr G A Ford, Head of Open Learning Training

Department of Mechanical Engineering, Manchester Metropolitan University

John Dalton Building, Chester Street, Manchester M1 5GD

Tel: 061 247 6247

Contact: Dr S Iwnicki

Department of Mechanical Manufacturing and Software Engineering, Napier University

10 Colinton Road, Edinburgh EH10 5DT

Tel: 031 444 2266

Contact: Dr T Muneer

School of Environmental Engineering, North East Surrey College of Technology

Reigate Road, Elwell, Epsom, Surrey KT17 3DS

Tel: 081 394 3066

Contact: Mr E G Davies, Dean of Faculty

South East Essex College of Arts and Technology

Caernavon Road, Southend-on-Sea, Essex SS2 6LS

Tel: 0702 220400

Contact: Mr M Kempen

Department of Mechanical and Manufacturing Engineering, University of Glamorgan

Pontypridd, Mid Glamorgan

Tel: 0443 480480

Contact: Professor J Ward, Head of Department

The University of Leeds

Leeds LS2 9JT

Tel: 0532 332494

Contact: Mrs D Taylor, Project Officer Industrial Short Courses

Energy Engineering, University of Portsmouth

Anglesea Building, Anglesea Road, Portsmouth PO1 3DJ

Tel: 0705 842329

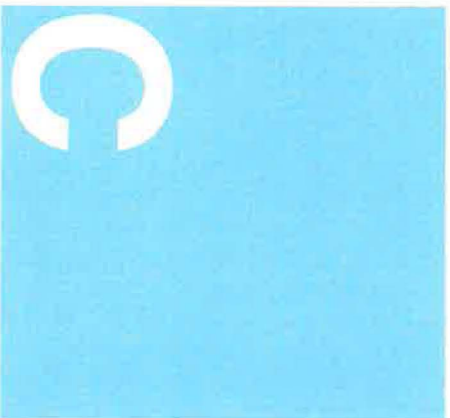
Contact: Dr M R I Purvis, Group Manager

Energy Engineering, University of Surrey

Guildford, Surrey GU2 5XH

Tel: 0483 300800 Ext. 2382

Contact: Dr A W E Henham, Director of Energy Engineering



EXAMPLE MATRIX FOR DETERMINING TRAINING REQUIREMENTS

COURSE	Motivation and Awareness	Energy Policy Strategy	Energy Management Information (M&T)	Energy in Buildings	Energy in Process Plant	Boiler Plant Site Services	Energy Purchase	Investment Appraisal of Energy Projects
JOB FUNCTION								
The Board	✓	✓					✓	✓
Senior Managers	✓	✓					✓	✓
Middle Managers	✓	✓	✓	✓				✓
Production Managers	✓	✓	✓					✓
Shift Managers	✓		✓		✓			
Laboratory Staff	✓			✓				
Computer Analysis	✓		✓					
Finance Department	✓	✓	✓				✓	✓
Engineering Department	✓				✓	✓		✓
Sales and Marketing	✓							
Process Operators	✓				✓	✓		✓
Site Services	✓		✓	✓	✓	✓		
Clerical/Administration	✓			✓				
Maintenance	✓			✓	✓	✓		
Quality	✓		✓					
Training	✓							
Health & Safety	✓			✓	✓	✓		
Warehouse/Dispatch	✓			✓				
Security	✓			✓				
Transport	✓							
Catering Staff	✓			✓				
Cleaners	✓			✓				

Example matrix completed for a fictitious company

COURSE	Motivation and Awareness	Energy Policy Strategy	Energy Management Information (M&T)	Energy in Buildings	Energy in Process Plant	Boiler Plant Site Services	Energy Purchase	Investment Appraisal of Energy Projects
JOB FUNCTION								
The Board								
Senior Managers								
Middle Managers								
Production Managers								
Shift Managers								
Laboratory Staff								
Computer Analysis								
Finance Department								
Engineering Department								
Sales and Marketing								
Process Operators								
Site Services								
Clerical/Administration								
Maintenance								
Quality								
Training								
Health & Safety								
Warehouse/Dispatch								
Security								
Transport								
Catering Staff								
Cleaners								

Example matrix for copying